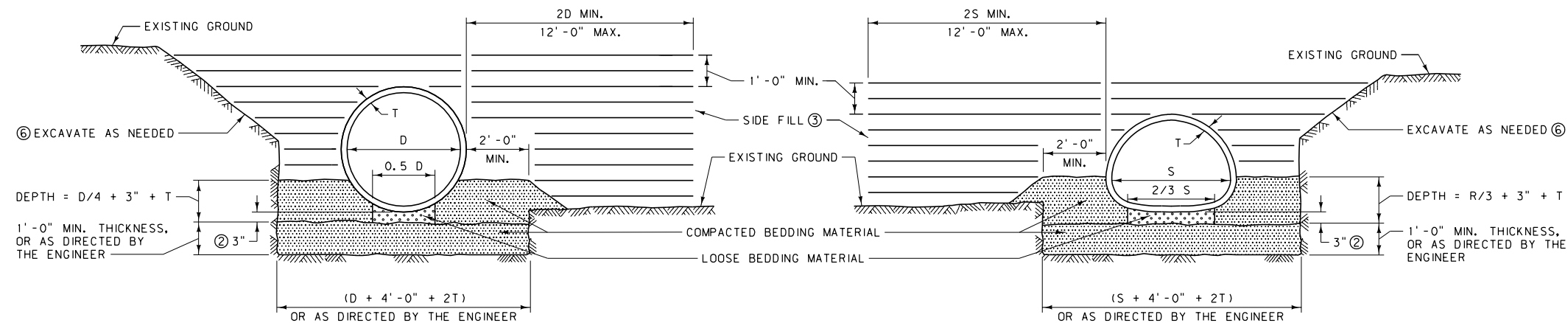
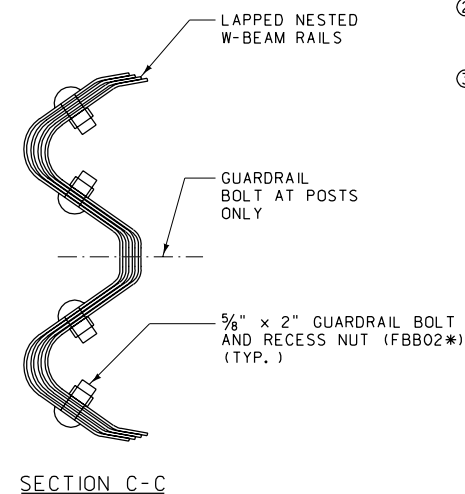
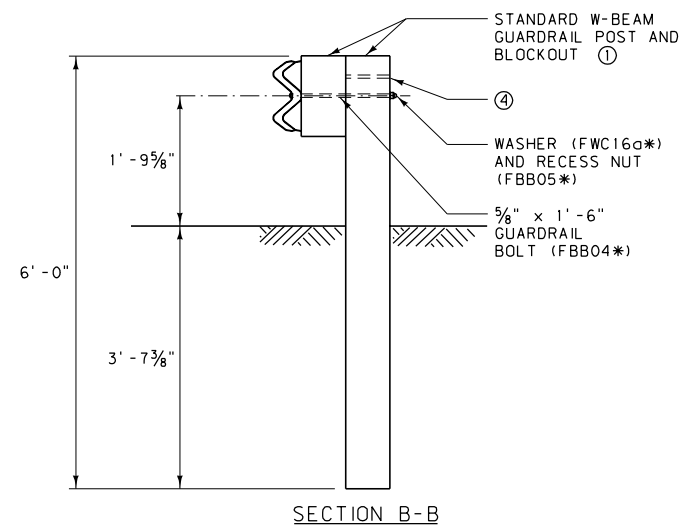
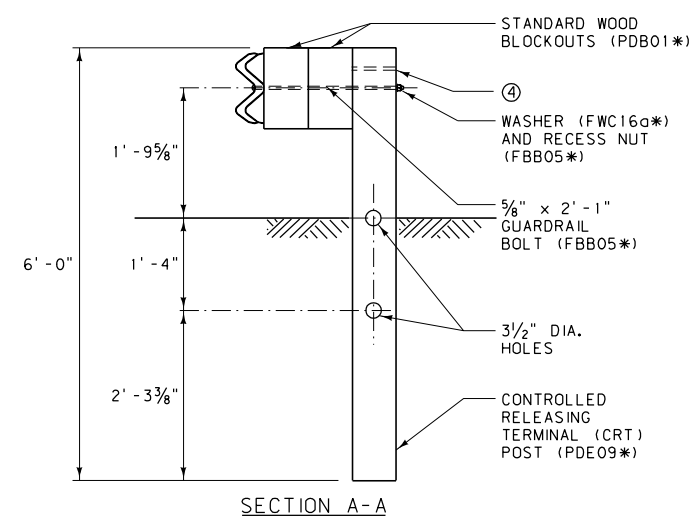
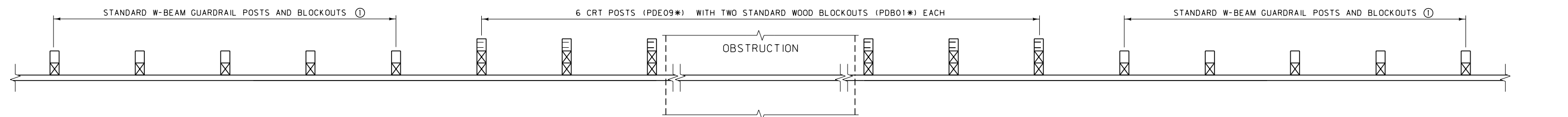
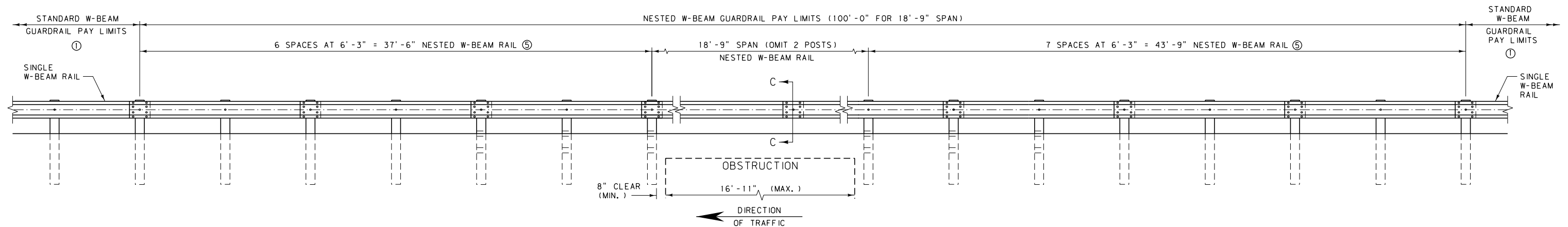
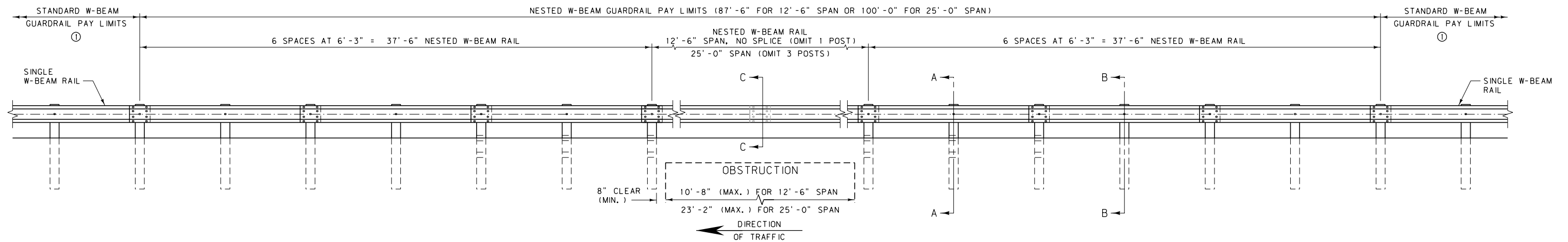


## 1-STANDARD BEDDING INSTALLATION



2-ROCK

### 3-FOUNDATION STABILIZATION




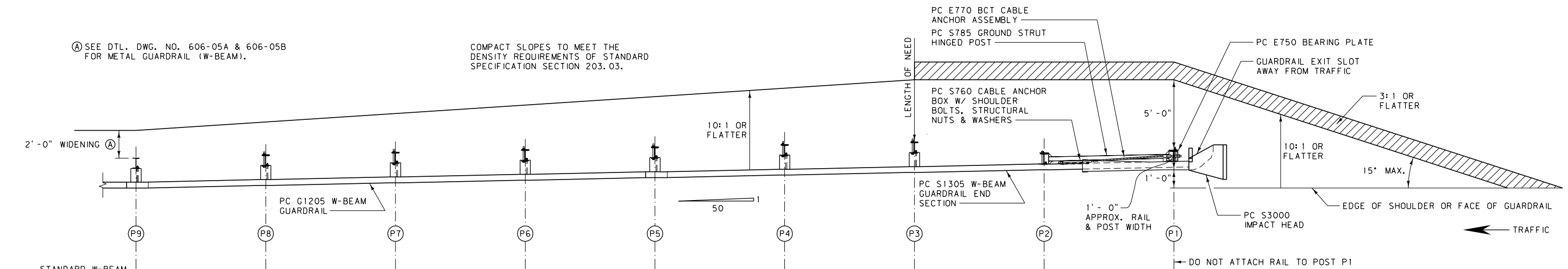
NOTES:

- ① SEE DTL. DWG. NO. 606-05A AND 606-05B FOR STANDARD W-BEAM GUARDRAIL AND ASSOCIATED HARDWARE.
- ② USE TWO STANDARD W-BEAM RAILS (RWM02a-b\* OR RWM22a-b\*) FOR NESTED W-BEAM.
- ③ LAP ALL NESTED W-BEAM RAIL IN THE DIRECTION OF ADJACENT TRAFFIC.

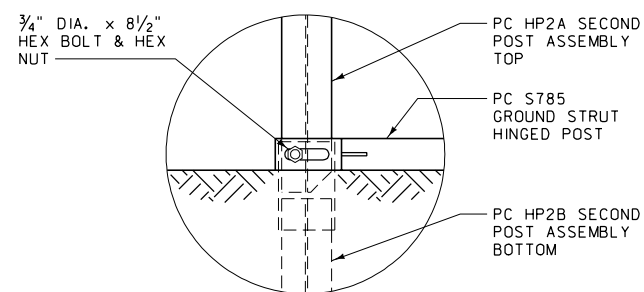
- ④ ALL POSTS ARE TO HAVE A SECOND BOLT HOLE AT 3" ABOVE THE FIRST.
- ⑤ THE SPLICE LOCATIONS ON THE 18'-9" SPAN MAY BE SHIFTED DOWNSTREAM BY 6'-3".
- ⑥ DO NOT INSTALL NESTED W-BEAM GUARDRAIL FOR OBSTACLES WITHIN 7.3' OF THE FACE OF THE RAIL.

\* SEE DTL. DWG. NO. 606-80 FOR SCHEDULE OF GUARDRAIL HARDWARE.

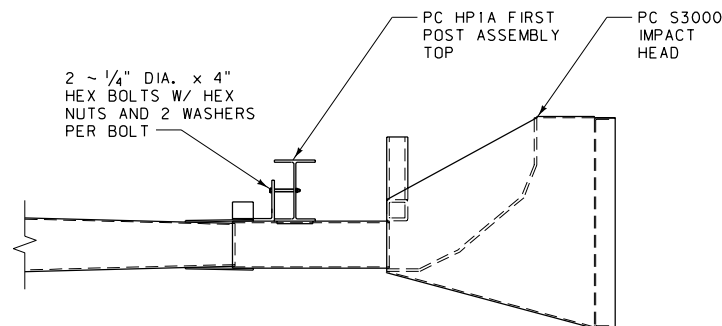
DETAILED DRAWING	
REFERENCE STANDARD SPEC. SECTION 606	DWG. NO. 606-09
NESTED W-BEAM GUARDRAIL	
EFFECTIVE: APRIL 2006	
 MONTANA DEPARTMENT OF TRANSPORTATION	



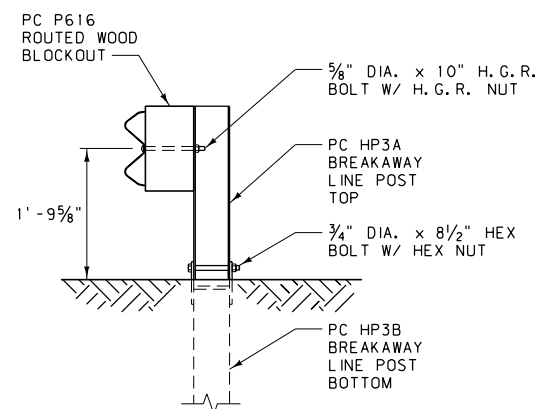
BILL OF MATERIAL		
PC	QTY	DESCRIPTION
S3000	1	IMPACT HEAD
S1305	1	W-BEAM GUARDRAIL END SECTION (25'-0")
G1205	1	W-BEAM GUARDRAIL (25'-0")
HP1A	1	FIRST POST ASSEMBLY TOP
HP1B	1	FIRST POST ASSEMBLY BOTTOM
HP2A	1	SECOND POST ASSEMBLY TOP
HP2B	1	SECOND POST ASSEMBLY BOTTOM
HP3A	6	BREAKAWAY LINE POST TOP
HP3B	6	BREAKAWAY LINE POST BOTTOM
E750	1	BEARING PLATE
S760	1	CABLE ANCHOR BOX
E770	1	BCT CABLE ANCHOR ASSEMBLY
S785	1	GROUND STRUT HINGED POST
P616	6	ROUTED WOOD BLOCKOUT
B580122	17	5/8" DIA. x 1/4" SPLICE BOLT, POST P2
B580904A	1	5/8" DIA. x 9" HEX BOLT
B581002	6	5/8" DIA. x 10" H.G.R. BOLT
N050	24	5/8" DIA. H.G.R. NUT
W050	2	5/8" DIA. WASHER
B340854A	7	3/4" DIA. x 8 1/2" HEX BOLT
N030	7	3/4" DIA. HEX NUT
N100	2	1" DIA. ANCHOR CABLE HEX NUT
W100	2	1" DIA. ANCHOR CABLE WASHER
B140404	2	1/4" DIA. x 4" HEX BOLT
N014	2	1/4" DIA. HEX NUT
W014	4	1/4" DIA. WASHER
SB58A	8	CABLE ANCHOR BOX SHOULDER BOLT
N055A	8	1/2" DIA. A325 STRUCTURAL NUT
W050A	16	5/16" DIA. (1 1/16" O.D.) A325 STRUCTURAL WASHER



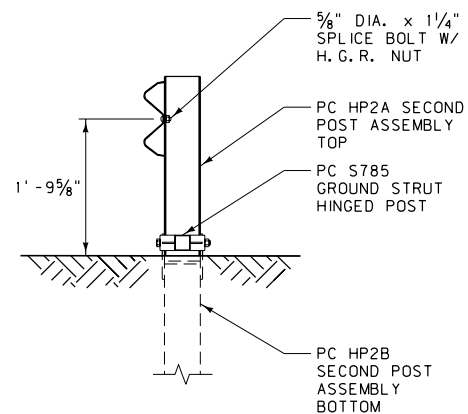
DETAIL D  
(AT POST P2)



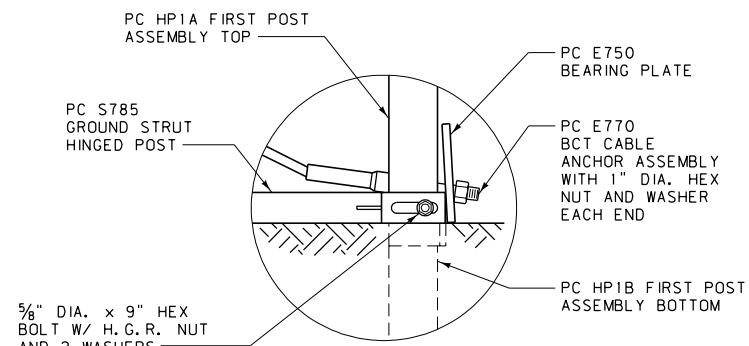
IMPACT HEAD CONNECTION DETAIL



SECTION B-B  
(TYP. AT POSTS P3 THRU P8)




SECTION A-A  
(AT POST P2)

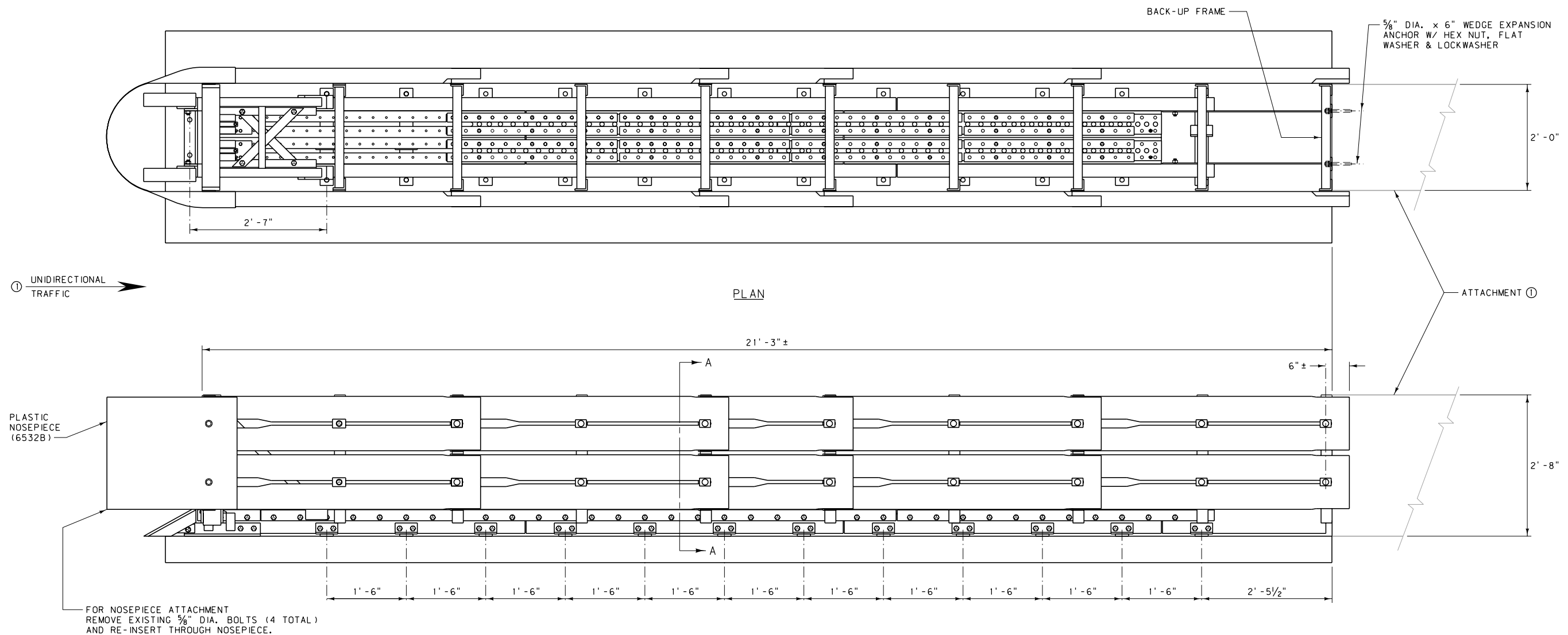


DETAIL K  
(AT POST P1)

NOTES:

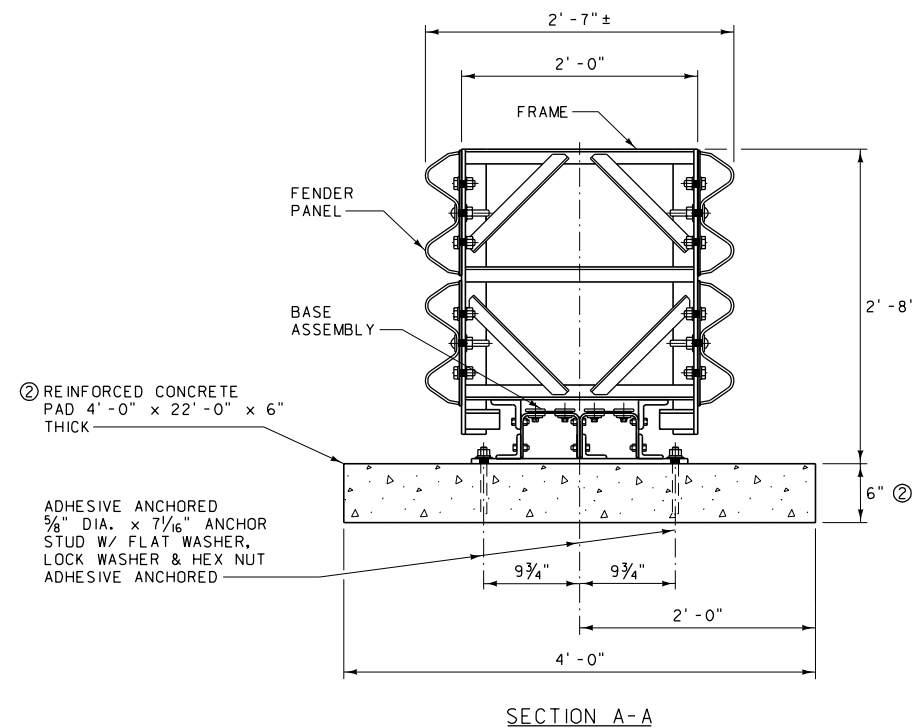
- USE THE SKT 350 TERMINAL SECTION ON DIVIDED ROADWAYS IF THE WIDTH IS 25 FEET OR GREATER BETWEEN FINISHED SURFACES. CONSIDER OTHER TERMINAL SECTIONS IF THE WIDTH IS LESS THAN 25 FEET BETWEEN FINISHED SURFACES.
- FLARE THE END SECTION AWAY FROM TRAFFIC AT A RATE OF 50:1 FOR 50 FEET (ILLUSTRATED). FLARES OF 50:1 FOR 100 FEET MAY ALSO BE USED. THE FLARE MAY BE OMITTED ON ROADS WITH SHOULDERS GREATER THAN 2 FEET IN WIDTH.
- PLACE A SELF-ADHESIVE OBJECT MARKER ON THE GUARDRAIL IMPACT HEAD FACE, HAVING ALTERNATING RETRO-REFLECTIVE BLACK AND YELLOW STRIPES SLOPED DOWNWARD AT AN ANGLE OF 45° TOWARDS THE SIDE ON WHICH TRAFFIC IS TO PASS.
- ATTACH REFLECTORS TO TERMINAL SECTION POSTS, PER DTL. DWG. NO. 606-05A & 606-05B.
- AFTER FINAL ASSEMBLY, RECHECK CABLE TO MAKE SURE IT IS TAUT AND HAS NOT RELAXED.
- OBTAIN ENGINEER'S APPROVAL OF MANUFACTURER INSTALLATION OPTIONS WHEN SITE CONDITIONS PREVENT THE USE OF THE OPTION SHOWN ON THIS DETAIL.
- LAP ALL W-BEAM SPLICES IN THE DIRECTION OF ADJACENT TRAFFIC.

DETAILED DRAWING	
REFERENCE STANDARD SPEC. SECTION 606	DWG. NO. 606-13B
OPTIONAL TERMINAL SECTION - SKT 350	
EFFECTIVE: APRIL 2006	
 serving you with pride	MONTANA DEPARTMENT OF TRANSPORTATION




TRACC BILL OF MATERIAL		
PART NUMBER	QTY	DESCRIPTION
* 25980A	1	TRACC UNIT (FULLY ASSEMBLED **)
3310G	4	5/8" DIA. LOCKWASHER
4451G	4	5/8" DIA. x 6" WEDGE EXP. ANCHOR
6825B	4	REFLECTIVE TAPE
6532B	1	PLASTIC NOSEPIECE
ANCHOR HARDWARE (FULL CONCRETE BASE)		
5204G	26	5/8" DIA. x 7 1/16" ANCHOR STUD
3310G	26	5/8" DIA. LOCKWASHER
3361G	26	5/8" DIA. HEX NUT
3300G	26	5/8" DIA. FLAT WASHER
5206B	3	ADHESIVE HIT HY 150 (CARTRIDGE)
ANCHOR HARDWARE (ASPHALT BASE)		
6380G	26	5/8" DIA. x 18" ALL THREADED ROD
3310G	26	5/8" DIA. LOCKWASHER
3361G	26	5/8" DIA. HEX NUT
3300G	26	5/8" DIA. FLAT WASHER
5206B	5	ADHESIVE HIT HY 150 (CARTRIDGE)

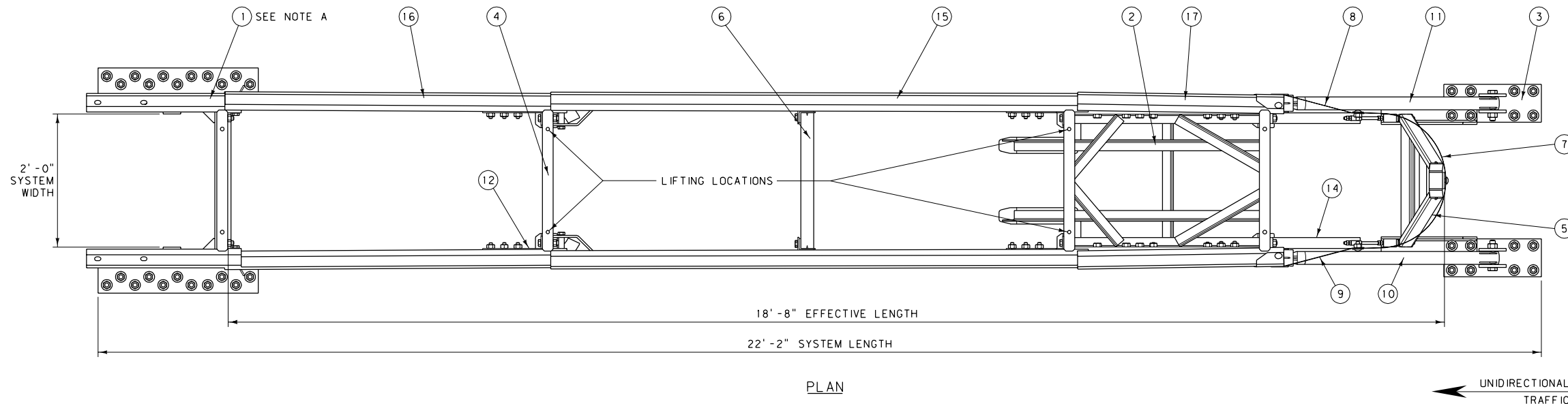
\* SEE DET. DWG. NO. 606-31B  
 \*\* EACH UNIT SHIPS 100% ASSEMBLED  
 (PLASTIC NOSE INSTALLED AFTER PLACEMENT)



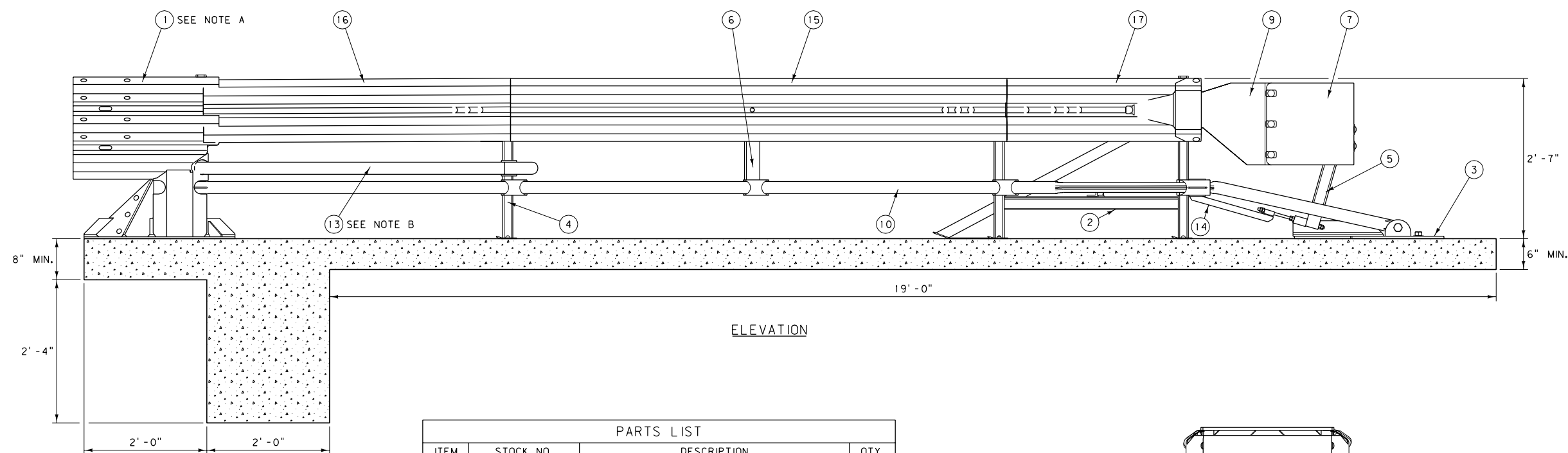
#### NOTES:

- ATTACHMENT SHOWN IS TO SHAPES WITH RECTANGULAR CROSS SECTIONS SUCH AS: PIERS, PARAPETS, AND MODIFIED CONCRETE BARRIER RAIL. TRAFFIC FLOW IS UNIDIRECTIONAL. ATTACHMENTS AND TRANSITIONS TO OTHER SHAPES, BARRIERS, RAILINGS AND BIDIRECTIONAL TRAFFIC FLOWS ARE AVAILABLE FROM THE MANUFACTURER.
- A 6" REINFORCED CONCRETE PAD IS SHOWN. OTHER FOUNDATION OPTIONS ARE:
  - 8" THICK UNREINFORCED CONCRETE
  - 8" THICK ASPHALT
  - 3" THICK ASPHALT OVER 3" THICK CONCRETE
  - 6" THICK ASPHALT OVER 6" THICK COMPACTED SUBBASE
 REINFORCEMENT DRAWINGS FOR THE REINFORCED CONCRETE PAD SHOWN ARE AVAILABLE FROM THE MANUFACTURER.
- SEE MANUFACTURER FOR MORE INFORMATION ON SPECIFIC DESIGNS, PRODUCT OPTIONS, INSTALLATION AND MAINTENANCE OF THE TRACC SYSTEM.

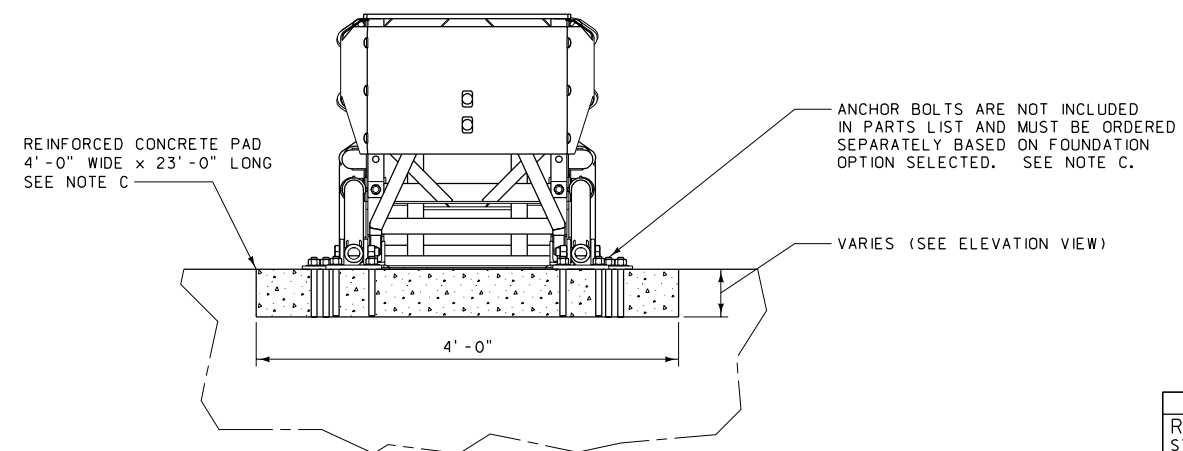
DETAILED DRAWING	
REFERENCE STANDARD SPEC. SECTION 606	DWG. NO. 606-30B
IMPACT ATTENUATOR - TRACC	
EFFECTIVE: APRIL 2006	
 MONTANA DEPARTMENT OF TRANSPORTATION	




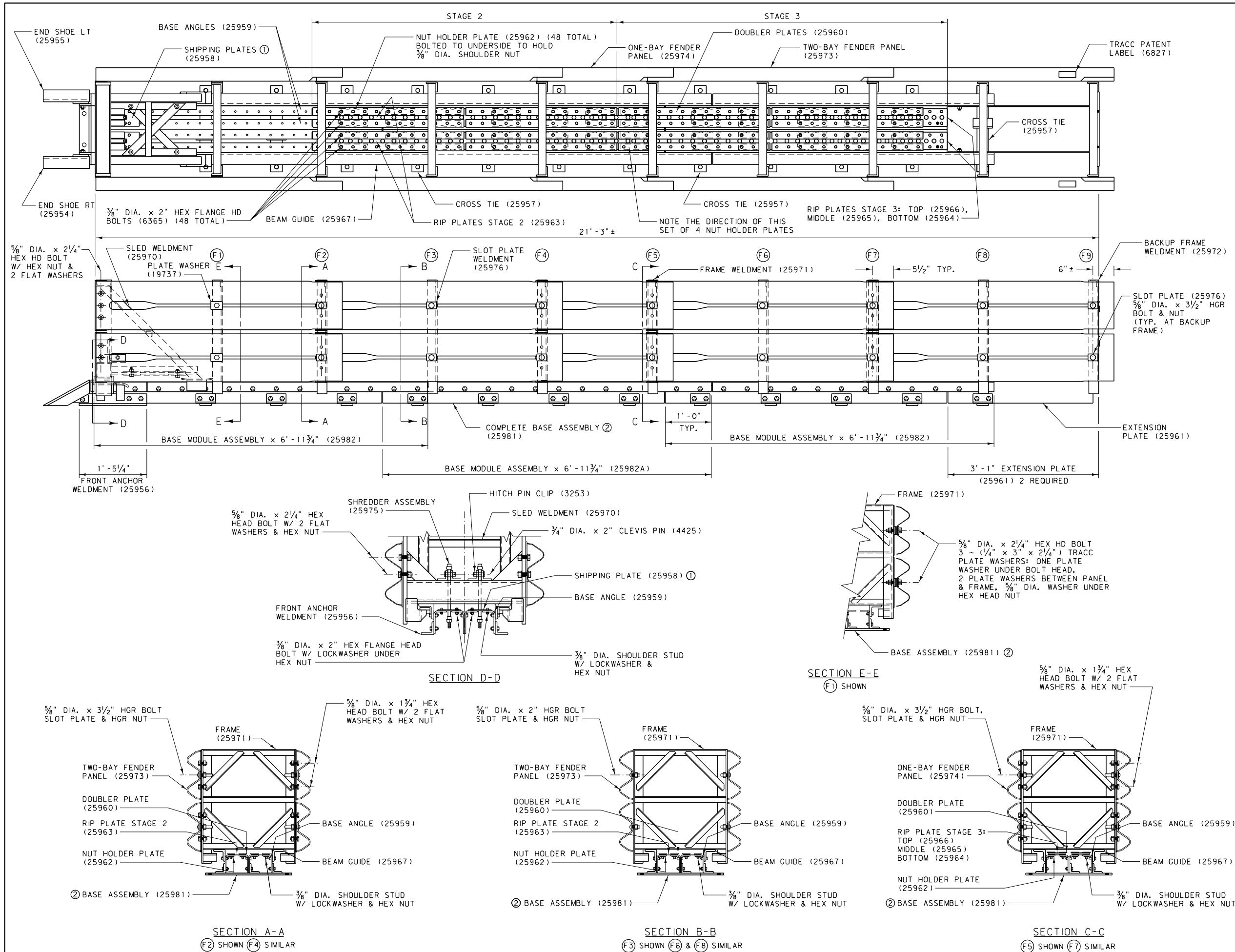
- NOTES:
- Ⓐ ATTACHMENT SHOWN IS TO SHAPES WITH RECTANGULAR CROSS SECTIONS SUCH AS: PIERS, PARAPETS, AND MODIFIED CONCRETE BARRIER RAIL. TRAFFIC FLOW IS UNIDIRECTIONAL. ATTACHMENTS AND TRANSITIONS TO OTHER SHAPES, BARRIERS, RAILINGS AND BIDIRECTIONAL TRAFFIC FLOWS ARE AVAILABLE FROM THE MANUFACTURER.
- Ⓑ PROVIDE ADEQUATE CLEARANCE (5'-0" MIN.) TO ALLOW REAR RAILS TO SLIDE REARWARD UPON IMPACT.
- Ⓒ A 6" REINFORCED CONCRETE PAD IS SHOWN. OTHER FOUNDATION OPTIONS ARE:
- a) 8" THICK UNREINFORCED CONCRETE
  - b) 8" THICK ASPHALT
  - c) 3' THICK ASPHALT OVER 3" THICK CONCRETE
  - d) 6" THICK ASPHALT OVER 6" THICK COMPACTED SUBBASE
  - e) 7" THICK REINFORCED DECK STRUCTURE
- SEE MANUFACTURER FOR REINFORCEMENT DRAWINGS AND ANCHORAGE REQUIREMENTS FOR ALL FOUNDATION OPTIONS.
- Ⓓ SEE MANUFACTURER FOR MORE INFORMATION ON SPECIFIC DESIGNS, INSTALLATION AND MAINTENANCE OF THE QUEST SYSTEM.



PARTS LIST			
ITEM	STOCK NO.	DESCRIPTION	QTY.
1	3562003-0000	BACKUP ASSEMBLY, 24, QUEST	1
2	3562002-0000	SUPPORT FRAME ASSY, BAY 1, 24, QUEST	1
3	2762015-0000	ANCHOR, FRONT, QUEST, G	2
4	3562005-0000	DIAPHRAGM ASSEMBLY, 24, BAY 3, QUEST	1
5	3562001-0000	TRIGGER ASSEMBLY, QUEST	1
6	3562004-0000	BRIDGE, 24, BAY 2, QUEST	1
7	2762026-0000	NOSE, QUEST, G	1
8	2762024-0000	NOSE TRANSITION, R, QUEST, G	1
9	2762025-0000	NOSE TRANSITION, L, QUEST, G	1
10	276200L-0000	SHAPER RAIL, L, QUEST, G	1
11	276200R-0000	SHAPER RAIL, R, QUEST, G	1
12	2762022-0000	BRACKET, PANEL, DIAPHRAGM, G	2
13	2762023-0000	REAR RAIL, QUEST, G	2
14	2762007-0000	TRIGGER STRAP, QUEST, G	2
15	2762013-0000	PANEL, BAY 2, QUEST, G	2
16	2762014-0000	PANEL, BAY 3, QUEST, G	2
17	2762033-0000	PANEL, BAY 1, QUEST, G	2




DETAILED DRAWING	
REFERENCE	DWG. NO.
STANDARD SPEC.	606-30C
SECTION 606	
IMPACT ATTENUATOR - QUEST	
EFFECTIVE: APRIL 2006	
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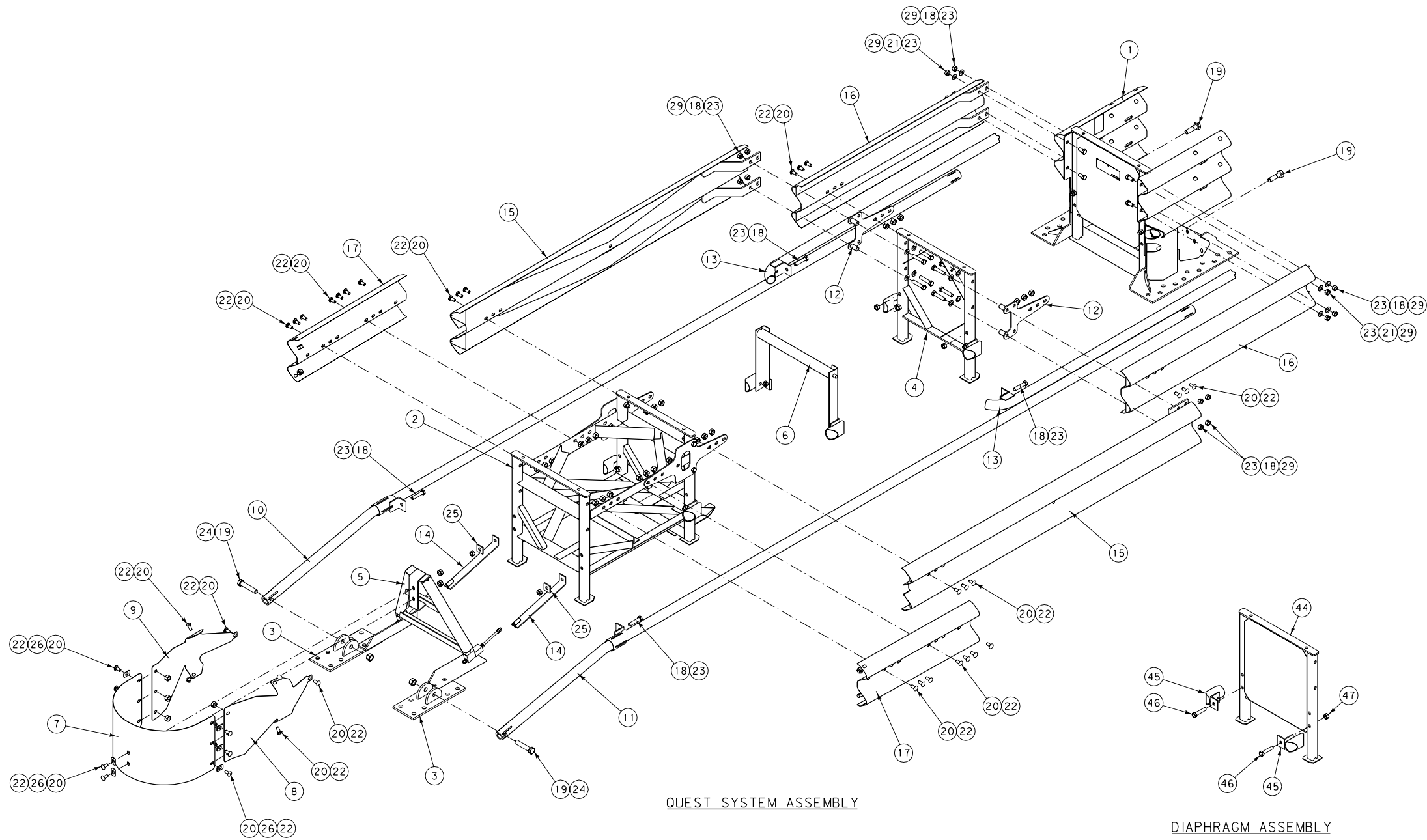


BILL OF MATERIAL		
PART NUMBER	QTY	DESCRIPTION
TRACC (25980A)		
19737G	12	1/4" x 3" x 2 1/4" TRACC WASHER
25970A	1	SLED WELDMENT
25971A	8	FRAME WELDMENT
25972A	1	BACKUP FRAME WELDMENT
25973A	16	TWO-BAY FENDER PANEL
25974A	4	ONE-BAY FENDER PANEL
25975A	2	SHREDDER ASSEMBLY
25976A	32	SLOT PLATE
25981A	1	ASSEMBLED BASE (SEE NOTE 2)
TRACC BASE (25981A)		
3256G	48	3/8" DIA. SHOULDER NUT
3361G	40	5/8" DIA. HEAVY HEX NUT
3391G	40	5/8" DIA. x 1 3/4" HEX HEAD BOLT
4252G	180	3/8" DIA. HEX NUT
4258G	180	3/8" DIA. LOCK WASHER
6340G	178	3/4" DIA. x 1 1/2" SHOULDER STUD
6365G	50	3/8" DIA. x 2" HEX FLANGE HD BOLT
25954A	1	END SHOE, RIGHT
25955A	1	END SHOE, LEFT
25956A	1	FRONT ANCHOR WELDMENT
25957A	3	CROSS TIE
25958G	2	RIP PLATE, STAGE 1 (SHIPPING PL.)
25960G	16	DOUBLERS
25961G	2	EXTENSION PLATE, REAR
25962G	48	NUT HOLDER (NUT RETAINER PLATE)
25963G	2	RIP PLATE, STAGE 2
25964G	2	RIP PLATE, STAGE 3, BOTTOM
25965G	2	RIP PLATE, STAGE 3, MIDDLE
25966G	2	RIP PLATE, STAGE 3, TOP
25982A	3	BASE MODULE ASSEMBLY
SHOP HARDWARE		
3253G	2	HITCH PIN CLIP
3340G	32	5/8" DIA. HGR NUT
3361G	46	5/8" DIA. HEX NUT
3391G	32	5/8" DIA. x 1 3/4" HEX HEAD BOLT
3400G	12	5/8" DIA. x 2" HGR BOLT
3435G	20	5/8" DIA. x 3 1/2" HGR BOLT
4372G	88	5/8" DIA. FLAT WASHER
4425G	2	3/4" DIA. x 2" CLEVIS PIN
5306G	14	5/8" DIA. x 2 1/4" HEX HEAD BOLT
6827B	2	TRACC PATENT LABEL

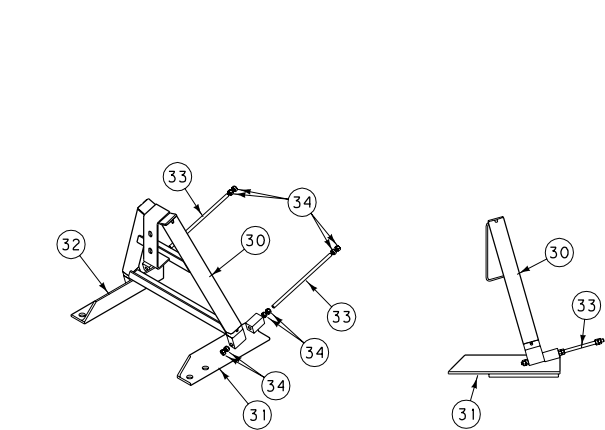
NOTES:

- ① SHIPPING PLATES MAINTAIN SLED POSITION DURING SHIPPING. IT IS NOT NECESSARY TO REMOVE SHIPPING PLATES AFTER INSTALLATION OR REPLACE AFTER REPAIRING DAMAGE TO TRACC UNIT.
- ② SEE MANUFACTURER FOR ADDITIONAL DETAILS AND DRAWINGS SHOWING COMPLETE ASSEMBLY OF ALL BASE COMPONENTS.

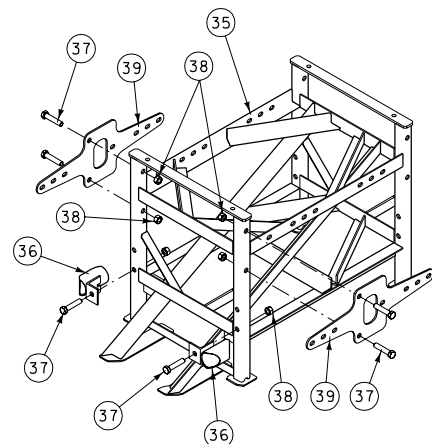
DETAILED DRAWING	
REFERENCE STANDARD SPEC. SECTION 606	DWG. NO. 606-31B
IMPACT ATTENUATOR TRACC ASSEMBLY DETAILS	
EFFECTIVE: APRIL 2006	
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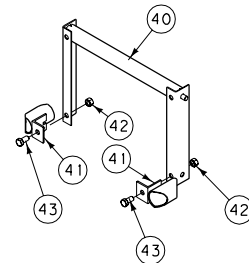
QUEST SYSTEM ASSEMBLY



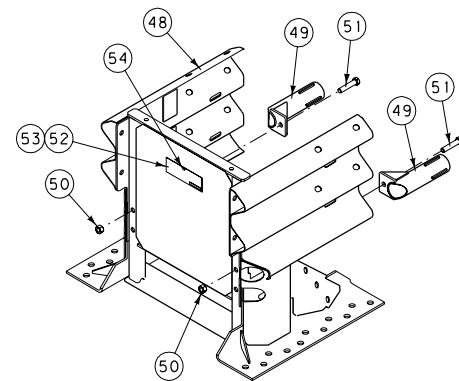
TRIGGER ASSEMBLY  
(ITEM 5)



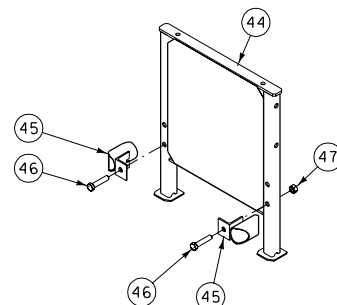
SUPPORT FRAME ASSEMBLY  
(ITEM 2)



BRIDGE  
(ITEM 6)



BACKUP ASSEMBLY  
(ITEM 1)



DIAPHRAGM ASSEMBLY  
(ITEM 4)

PARTS LIST


ITEM	STOCK NO.	DESCRIPTION	QTY.
1	3562003-0000	BACKUP ASSEMBLY, 24, QUEST	1
2	3562002-0000	SUPPORT FRAME ASSY, BAY 1, 24, QUEST	1
3	2762015-0000	ANCHOR, FRONT, QUEST, G	2
4	3562005-0000	DIAPHRAGM ASSEMBLY, 24, BAY 3, QUEST	1
5	3562001-0000	TRIGGER ASSEMBLY, QUEST	1
6	3562004-0000	BRIDGE ASSEMBLY, 24, BAY 2, QUEST	1
7	2762026-0000	NOSE, QUEST, G	1
8	2762024-0000	NOSE TRANSITION, R, QUEST, G	1
9	2762025-0000	NOSE TRANSITION, L, QUEST, G	1
10	276200L-0000	SHAPER RAIL, L, QUEST, G	1
11	276200R-0000	SHAPER RAIL, R, QUEST, G	1
12	2762022-0000	BRACKET, PANEL, DIAPHRAGM, G	2
13	2762023-0000	REAR RAIL, QUEST, G	2
14	2762007-0000	TRIGGER STRAP, QUEST, G	2
15	2762013-0000	PANEL, BAY 2, QUEST, G	2
16	2762014-0000	PANEL, BAY 3, QUEST, G	2
17	2762033-0000	PANEL, BAY 1, QUEST, G	2
18	2699251-0000	BOLT, HX, 3/4" DIA. x 3 1/2", G5, G	16
19	2701014-0000	BOLT, HX, 1" DIA. x 5", G8, G	4
20	2701811-0000	BOLT, RAIL, 5/8" DIA. x 1 1/4", G5, G	40
21	2701931-0000	BOLT, HX, 3/4" DIA. x 1 1/2", G5, G	4
22	2704191-0000	NUT, HX, 5/8" DIA., G, RAIL	40
23	2704091-0000	NUT, HX, 3/4" DIA., G	20
24	2704161-0000	NUT, HX, 1" DIA., G	2
25	2708161-0000	WASHER, BAR, 2" x 2" x 1/4", G	2
26	2708871-1000	WASHER, BAR, 1 1/4" x 2" x 1/8", ROUNDED, G	8
27	2700031-0000	INSTALL INSTRUCTIONS, QUEST	1
28	2735831-3500	MATERIAL SAFETY INFO NOTICE	1
29	2708081-0000	WASHER, FLAT, 3/4" DIA. (2" O.D.), HVY, G	16
TRIGGER ASSEMBLY (ITEM 5)			
30	2762008-0000	TRIGGER FRAME, QUEST, G	1
31	2762011-0000	ANCHOR, TRIGGER, R, QUEST, G	1
32	2762012-0000	ANCHOR, TRIGGER, L, QUEST, G	1
33	2699034-0000	ROD, THREADED, 1/2" DIA. x 13 1/2", B7, G	2
34	2704911-0000	NUT, HX, 1/2" DIA., G5, G	12
SUPPORT FRAME ASSEMBLY (ITEM 2)			
35	2762010-0000	SUPPORT FRAME, BAY 1, 24, QUEST, G	1
36	2762003-0000	RAIL GUIDE, DIAPHRAGM, QUEST, G	2
37	2699251-0000	BOLT, HX, 3/4" DIA. x 3 1/2", G5, G	6
38	2704091-0000	NUT, HX, 3/4" DIA., G	6
39	2762021-0000	BRACKET, PANEL, BAY 1 FRAME, QUEST, G	2
BRIDGE (ITEM 6)			
40	2762016-0000	BRIDGE, 24, QUEST, G	1
41	2762003-0000	RAIL GUIDE, DIAPHRAGM, QUEST, G	2
42	2704091-0000	NUT, HX, 3/4" DIA., G	2
43	2701931-0000	BOLT, HX, 3/4" DIA. x 1 1/2", G5, G	2
DIAPHRAGM ASSEMBLY (ITEM 4)			
44	2762018-0000	DIAPHRAGM, 24, BAY 3, QUEST, G	1
45	2762003-0000	RAIL GUIDE, DIAPHRAGM, QUEST, G	2
46	2699251-0000	BOLT, HX, 3/4" DIA. x 3 1/2", G5, G	2
47	2704091-0000	NUT, HX, 3/4" DIA., G	2
BACKUP ASSEMBLY (ITEM 1)			
48	2762020-0000	BACKUP, 24, QUEST, G	1
49	2762017-0000	SHAPER, BACKUP, QUEST, G	2
50	2704091-0000	NUT, HX, 3/4" DIA., G	2
51	2699251-0000	BOLT, HX, 3/4" DIA. x 3 1/2", G5, G	2
52	2735711-0000	DECAL, CAUTION, ALL PRODUCTS	1
53	2735712-3500	DECAL, PRODUCT, QUEST	1
54	2705121-0000	RIVET, ST, SD68BS, 3/16" DIA. x 1/2", DH	1

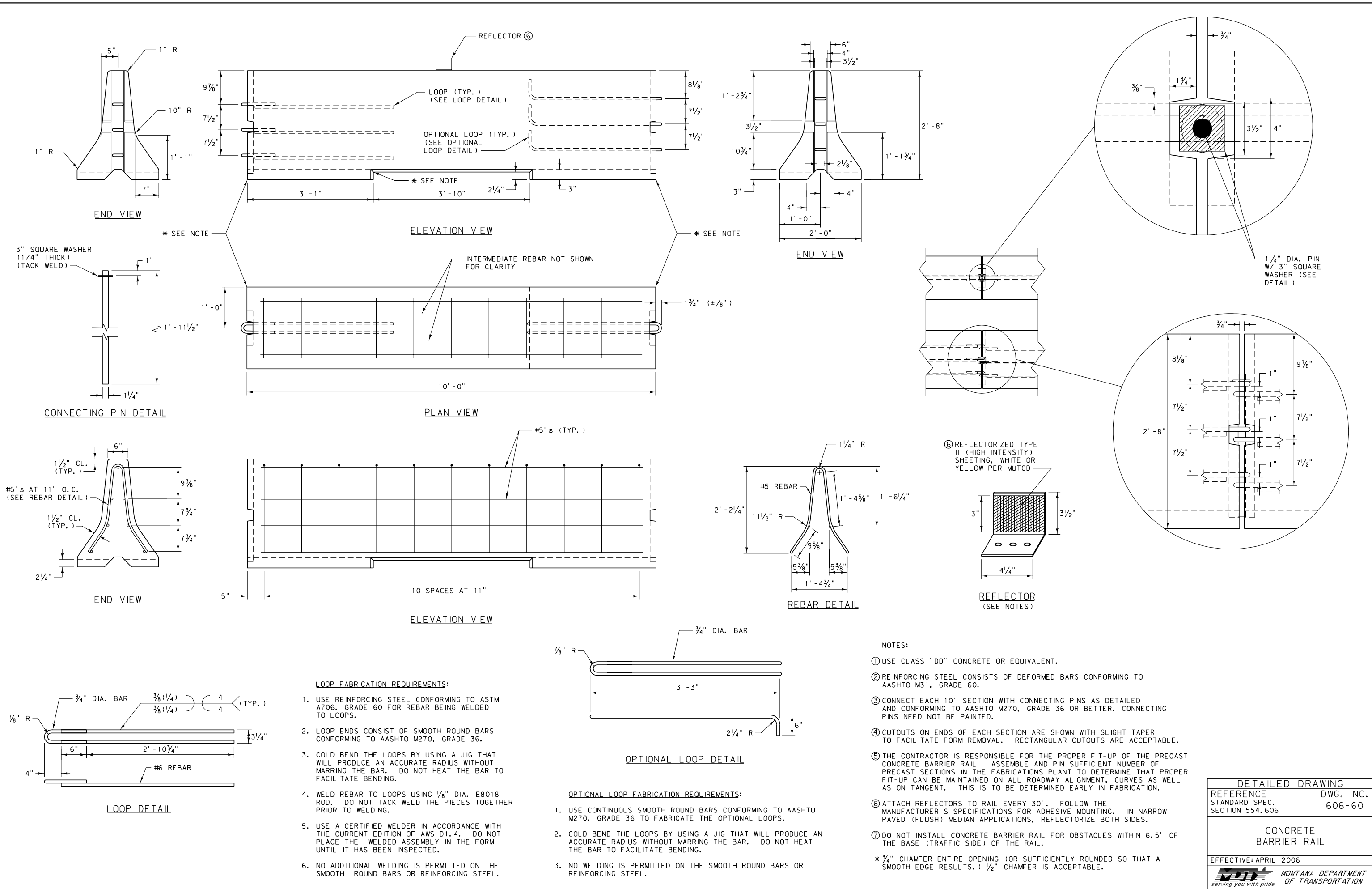
DETAILED DRAWING

REFERENCE DWG. NO.  
STANDARD SPEC. 606-31C  
SECTION 606

IMPACT ATTENUATOR -  
QUEST  
ASSEMBLY DETAILS

EFFECTIVE: APRIL 2006


 MONTANA DEPARTMENT  
OF TRANSPORTATION

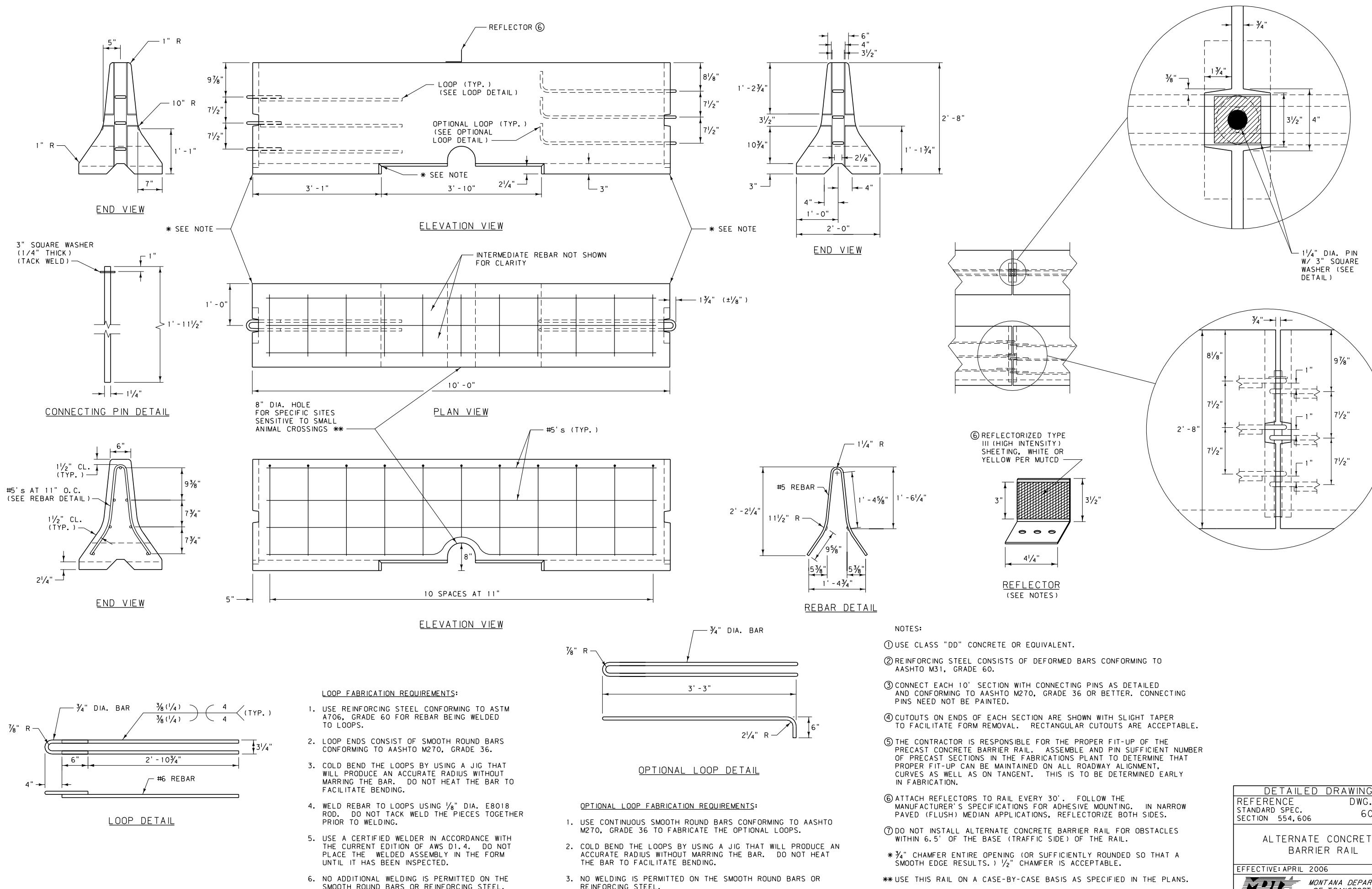


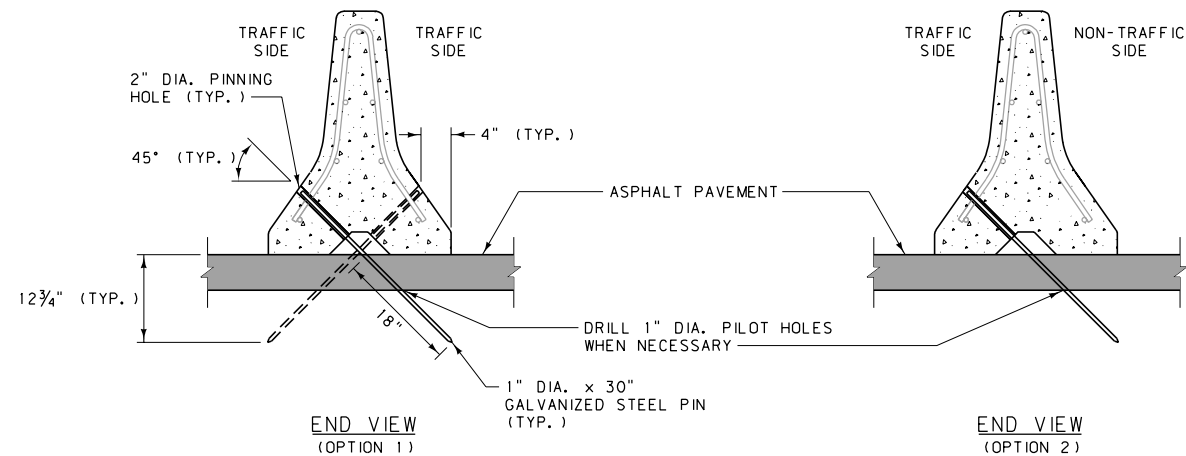
- LOOP FABRICATION REQUIREMENTS:**
1. USE REINFORCING STEEL CONFORMING TO ASTM A706, GRADE 60 FOR REBAR BEING WELDED TO LOOPS.
  2. LOOP ENDS CONSIST OF SMOOTH ROUND BARS CONFORMING TO AASHTO M270, GRADE 36.
  3. COLD BEND THE LOOPS BY USING A JIG THAT WILL PRODUCE AN ACCURATE RADIUS WITHOUT MARRING THE BAR. DO NOT HEAT THE BAR TO FACILITATE BENDING.
  4. WELD REBAR TO LOOPS USING 1/8" DIA. E8018 ROD. DO NOT TACK WELD THE PIECES TOGETHER PRIOR TO WELDING.
  5. USE A CERTIFIED WELDER IN ACCORDANCE WITH THE CURRENT EDITION OF AWS D1.4. DO NOT PLACE THE WELDED ASSEMBLY IN THE FORM UNTIL IT HAS BEEN INSPECTED.
  6. NO ADDITIONAL WELDING IS PERMITTED ON THE SMOOTH ROUND BARS OR REINFORCING STEEL.

- OPTIONAL LOOP FABRICATION REQUIREMENTS:**
1. USE CONTINUOUS SMOOTH ROUND BARS CONFORMING TO AASHTO M270, GRADE 36 TO FABRICATE THE OPTIONAL LOOPS.
  2. COLD BEND THE LOOPS BY USING A JIG THAT WILL PRODUCE AN ACCURATE RADIUS WITHOUT MARRING THE BAR. DO NOT HEAT THE BAR TO FACILITATE BENDING.
  3. NO WELDING IS PERMITTED ON THE SMOOTH ROUND BARS OR REINFORCING STEEL.

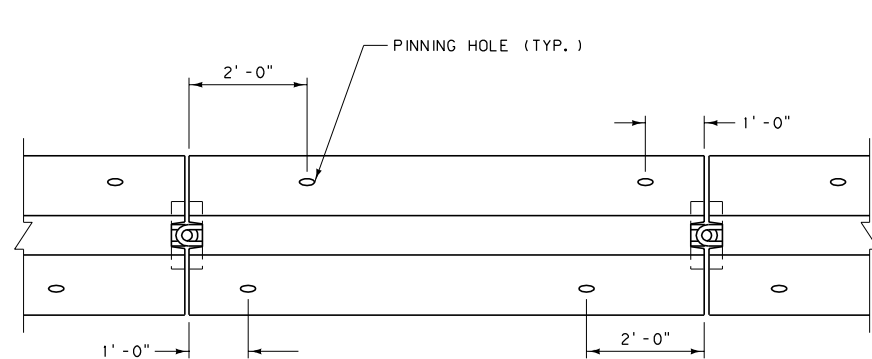
- NOTES:**
- ① USE CLASS "DD" CONCRETE OR EQUIVALENT.
  - ② REINFORCING STEEL CONSISTS OF DEFORMED BARS CONFORMING TO AASHTO M31, GRADE 60.
  - ③ CONNECT EACH 10' SECTION WITH CONNECTING PINS AS DETAILED AND CONFORMING TO AASHTO M270, GRADE 36 OR BETTER. CONNECTING PINS NEED NOT BE PAINTED.
  - ④ CUTOUTS ON ENDS OF EACH SECTION ARE SHOWN WITH SLIGHT TAPER TO FACILITATE FORM REMOVAL. RECTANGULAR CUTOUTS ARE ACCEPTABLE.
  - ⑤ THE CONTRACTOR IS RESPONSIBLE FOR THE PROPER FIT-UP OF THE PRECAST CONCRETE BARRIER RAIL. ASSEMBLE AND PIN SUFFICIENT NUMBER OF PRECAST SECTIONS IN THE FABRICATIONS PLANT TO DETERMINE THAT PROPER FIT-UP CAN BE MAINTAINED ON ALL ROADWAY ALIGNMENT, CURVES AS WELL AS ON TANGENT. THIS IS TO BE DETERMINED EARLY IN FABRICATION.
  - ⑥ ATTACH REFLECTORS TO RAIL EVERY 30'. FOLLOW THE MANUFACTURER'S SPECIFICATIONS FOR ADHESIVE MOUNTING. IN NARROW PAVED (FLUSH) MEDIAN APPLICATIONS, REFLECTORIZE BOTH SIDES.
  - ⑦ DO NOT INSTALL CONCRETE BARRIER RAIL FOR OBSTACLES WITHIN 6.5' OF THE BASE (TRAFFIC SIDE) OF THE RAIL.
- \* 3/4" CHAMFER ENTIRE OPENING (OR SUFFICIENTLY ROUNDED SO THAT A SMOOTH EDGE RESULTS.) 1/2" CHAMFER IS ACCEPTABLE.

DETAILED DRAWING	
REFERENCE STANDARD SPEC. SECTION 554.606	DWG. NO. 606-60
CONCRETE BARRIER RAIL	
EFFECTIVE: APRIL 2006	
 serving you with pride	MONTANA DEPARTMENT OF TRANSPORTATION

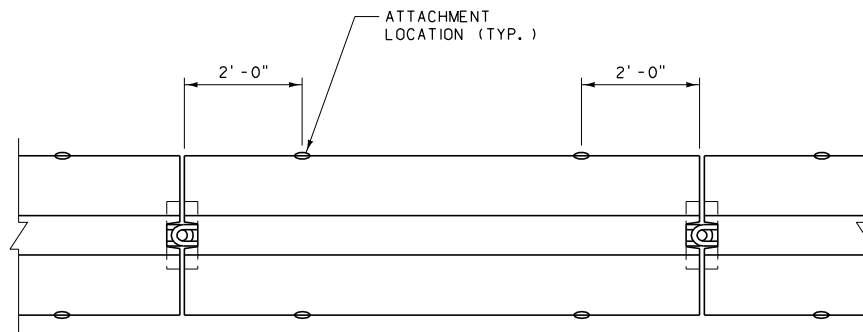




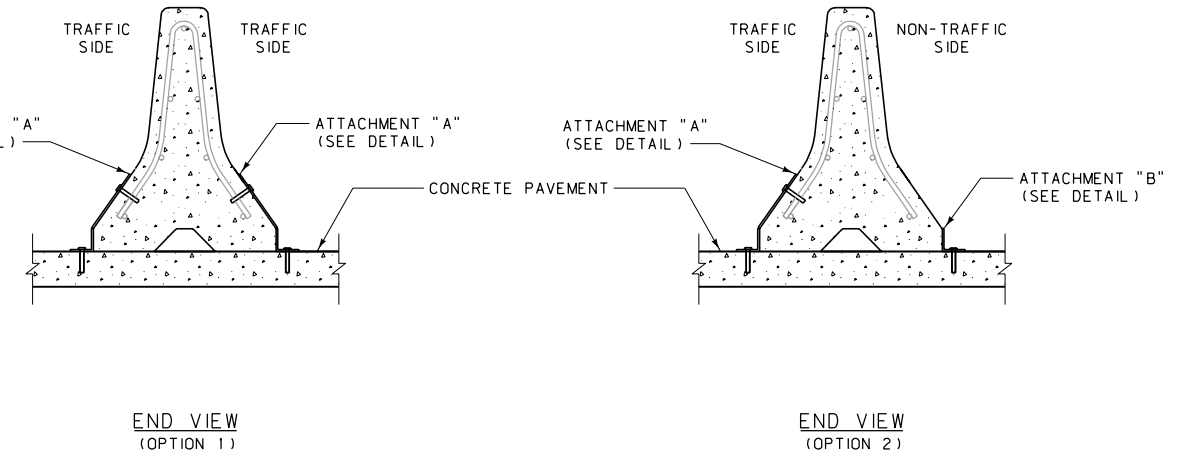
TYPE 1 ANCHOR  
(FOR TEMPORARY OR PERMANENT CONCRETE BARRIER  
RAIL INSTALLATIONS ON ASPHALT PAVEMENT)



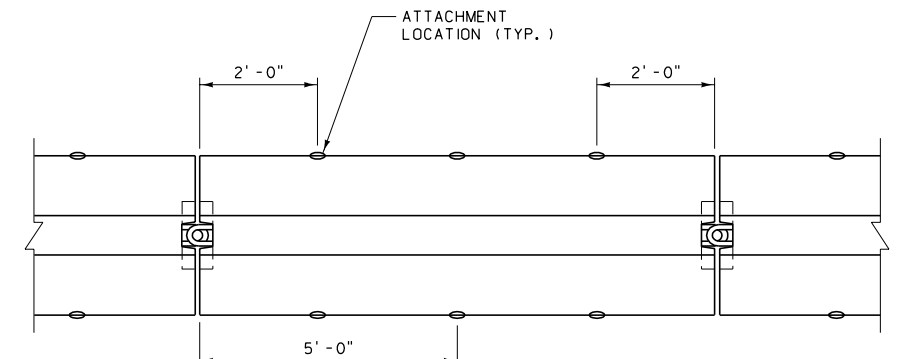
TYPE 1 ANCHOR  
PLAN VIEW



TYPE 2 ANCHOR  
PLAN VIEW



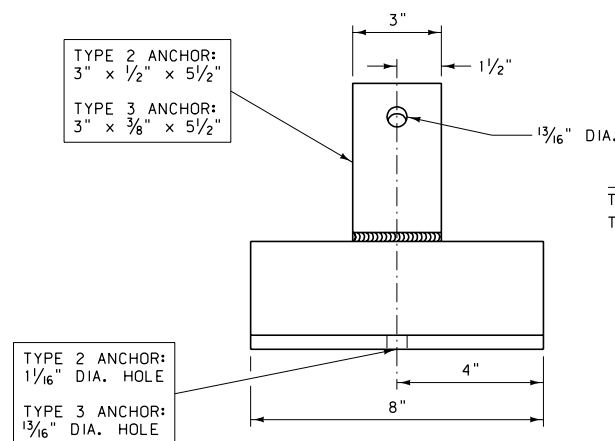
TYPE 2 & 3 ANCHORS  
(FOR TEMPORARY CONCRETE BARRIER RAIL  
INSTALLATIONS ON CONCRETE PAVEMENT)



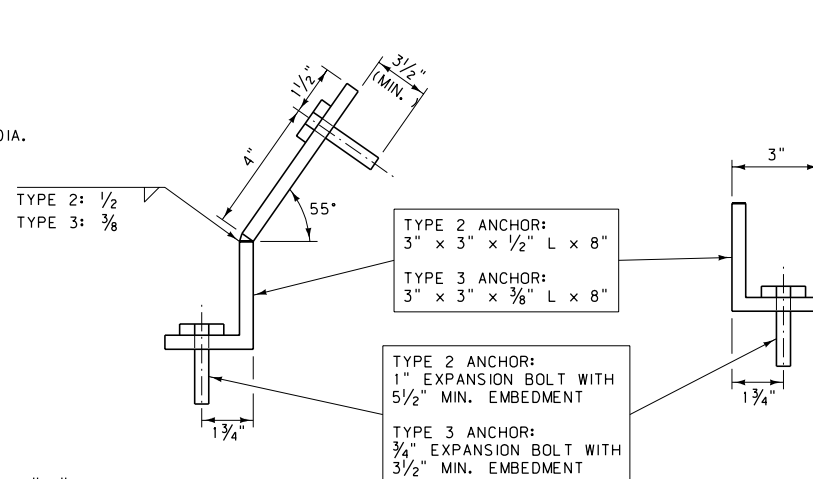
TYPE 3 ANCHOR  
PLAN VIEW

#### NOTES:

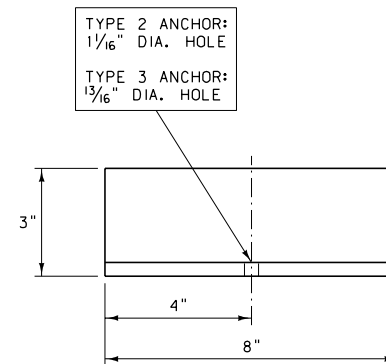
- USE THESE ANCHORS WITH STANDARD CONCRETE BARRIER RAIL (C.B.R.), AS SHOWN IN DTL. DWG. NO. 606-60, WHEN DEFLECTION OF THE SYSTEM NEEDS TO BE LIMITED.
- CAST THE PINNING HOLES INTO THE C.B.R. USING 2" I.D. STEEL PIPE. DO NOT DRILL THE PINNING HOLES.
- USE STEEL CONFORMING TO AASHTO M270, GRADE 36 OR BETTER FOR PINS AND ATTACHMENT ANGLES. GALVANIZE IN ACCORDANCE WITH AASHTO M111.
- USE TYPE 2 ANCHORS WHEN A DEEPER EMBEDMENT (5 1/2") INTO THE BRIDGE DECK OR CONCRETE PAVEMENT IS PERMISSIBLE.
- ADJUST THE LOCATION OF THE TYPE 2 OR TYPE 3 ANCHORS TO AVOID THE MAIN REINFORCING WHEN PLACED ON BRIDGE DECK.
- USE SHIMS TO PROPERLY FIT THE TYPE 2 AND TYPE 3 ANCHORS TO THE BARRIER AND ROADWAY SURFACES.
- AFTER REMOVING TYPE 2 OR TYPE 3 ANCHORS, CLEAN THE HOLES IN THE CONCRETE PAVEMENT AND FILL WITH AN APPROVED NON-SHRINK OR EPOXY GROUT.
- REMOVE TYPE 1 ANCHORS BY FIRST DRIVING THE STEEL PINS DOWN THROUGH THE BARRIER TO ALLOW LIFTING OF THE BARRIER WITHOUT INTERFERENCE. THEN REMOVE THE PINS FROM THE PAVEMENT AND FILL THE PINNING HOLES WITH AN APPROVED SEALANT.
- DO NOT INSTALL ANCHORED CONCRETE BARRIER RAIL FOR OBSTACLES WITHIN 3.5' OF THE BASE (TRAFFIC SIDE) OF THE RAIL.




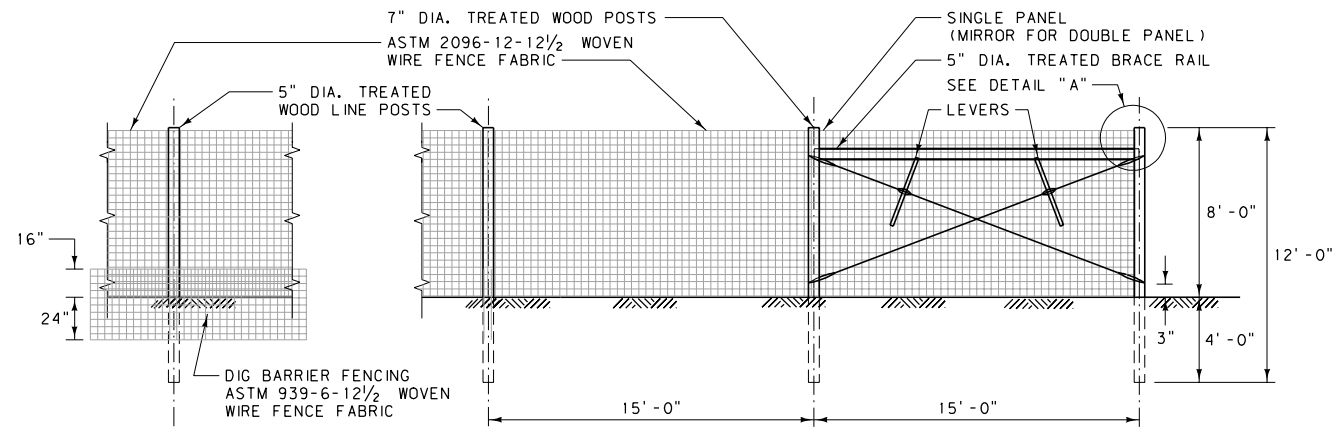
ATTACHMENT "A" DETAIL



ATTACHMENT "B" DETAIL

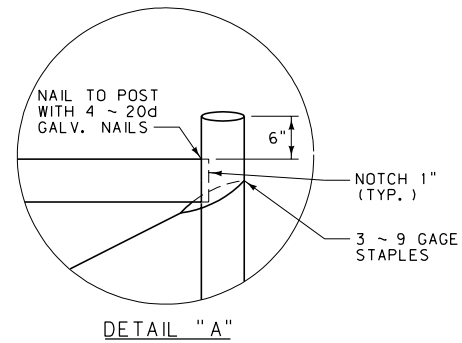


DETAILED DRAWING	
REFERENCE	DWG. NO.
STANDARD SPEC.	606-62
SECTION 554,606	
CONCRETE BARRIER RAIL ANCHORS	
EFFECTIVE: APRIL 2006	
 MONTANA DEPARTMENT OF TRANSPORTATION	



WILDLIFE FENCE W/ DIG BARRIER  
PANELS NOT SHOWN

WILDLIFE FENCE



BRACE WIRES - ONE CONTINUOUS 9 OR 12½ GAGE SMOOTH WIRE DOUBLED TO FORM A FOUR WIRE BRACE. TIE THE TWO ENDS NEAR THE TOP OF THE PANEL POSTS.

LEVERS - 1½" x 2" x 12" MINIMUM SIZE.

WIRE SPACING TABLE	
WILDLIFE-FRIENDLY FARM FENCE	
48" FENCE HEIGHT	
BARBLESS WIRE (12½ GAGE)	12"
BARB WIRE (12½ GAGE)	10"
BARBLESS WIRE (12½ GAGE)	10"
	16"
• DENOTES STAPLE LOCATIONS	

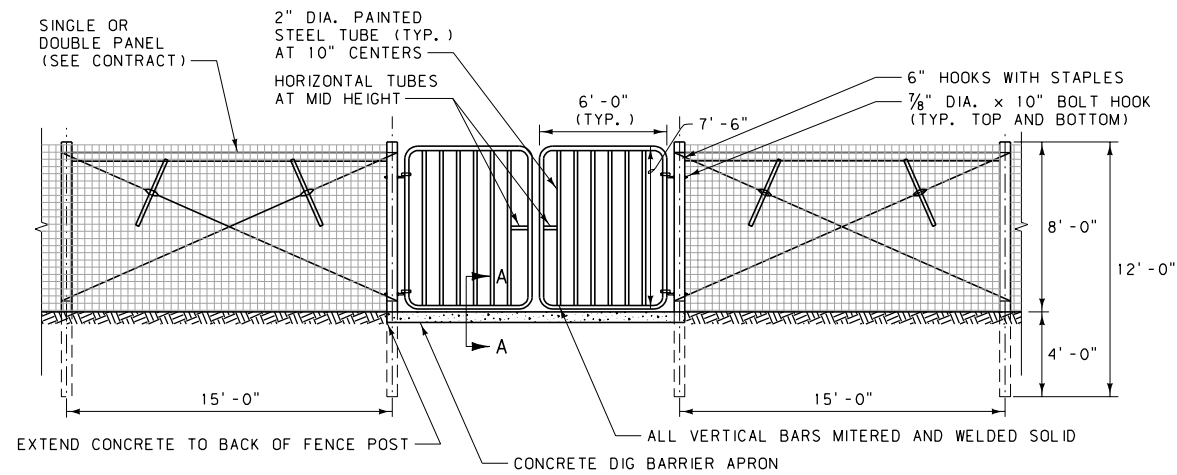
#### STAYS

1. USE WIRE STAYS ON ALL FENCES.
2. LOCATE STAYS HALFWAY BETWEEN FENCE POSTS.
3. WIRE STAYS ARE 2" LONGER THAN THE DISTANCE BETWEEN THE TOP AND BOTTOM WIRES.

#### NOTES:

SEE DTL. DWG. NO. 607-00 FOR ADDITIONAL FARM FENCE DETAILS

WILDLIFE-FRIENDLY FARM FENCE

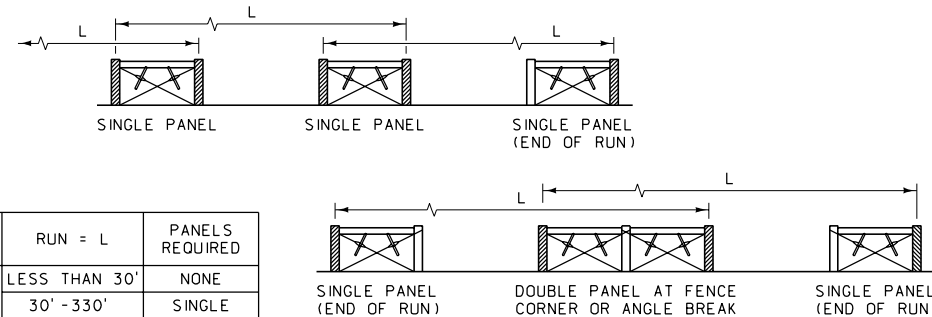


METAL MAINTENANCE ACCESS GATE  
CHAIN AND LOCK TO BE SUPPLIED BY MDT FORCES

FENCE TYPE	RUN = L	PANELS REQUIRED
WILDLIFE	LESS THAN 30'	NONE
	30' - 330'	SINGLE

#### NOTE:

TIE OFF ON ALL CROSS HATCHED OR SHADED POSTS.



FENCE PANEL TYPES

#### NOTES:

PLACE ALL FENCE WIRE ON PASTURE SIDE OF POST, EXCEPT ON CURVES. THEN, PLACE THE WIRE ON THE OUTSIDE OF THE CURVE.

POST SPACING IS GENERALLY MEASURED PARALLEL TO GROUND.

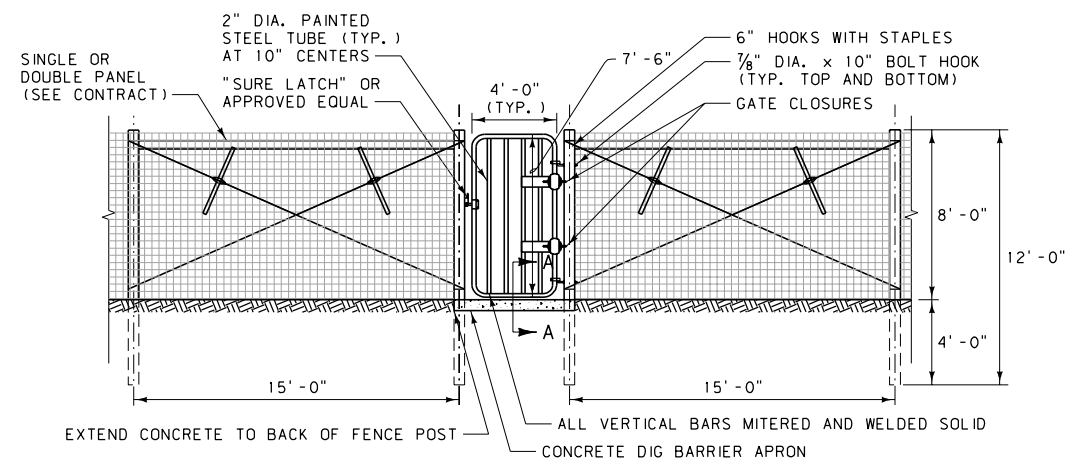
LINE POST SPACING IS 15'-0" CENTER TO CENTER. LINE POST SPACING FROM BRACE OR PANEL POST IS 15'-0" CENTER TO CENTER.

TO ATTACH WOVEN WIRE TO AN END POST, REMOVE TWO OR THREE VERTICAL STAY WIRES FROM THE END OF THE FENCE. PLACE THE FIRST COMPLETE VERTICAL STAY WIRE AGAINST THE POST. START AT THE MIDDLE OF THE HORIZONTAL LINE WIRES, WRAPPING AROUND THE END POST AT LEAST TWO TIMES AND THEN WRAPPING AROUND ITSELF FIVE TIMES.

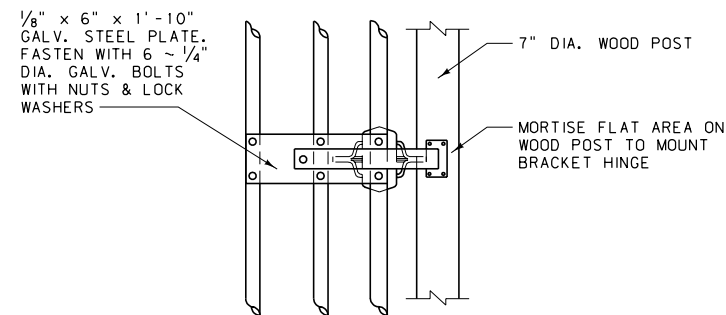
A DEADMAN MAY BE A PRECAST CONCRETE BLOCK, A CAST IN PLACE CONCRETE BLOCK, A ROCK OR OTHER APPROVED OBJECT WEIGHING AT LEAST 260 LB. BURY THE DEADMAN IN THE GROUND WITH AT LEAST 2'-0" OF COVER. ATTACH THE DEADMAN TO THE FENCE WITH 3 STRANDS OF 9 GAGE WIRE OR 6 STRANDS OF 12½ GAGE WIRE. SEE DTL. DWG. NO. 607-10 FOR ALTERNATE DEADMAN.

STAPLE THE BOTTOM, TOP, CENTER AND ALTERNATE WIRES OF WOVEN WIRE TO WOOD LINE POSTS.

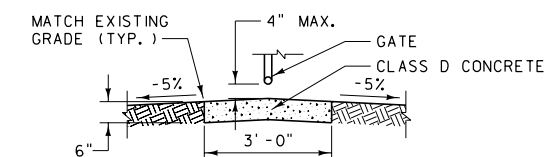
STAPLE ALL WIRES OF WOVEN WIRE TO WOOD CORNER POSTS OR POST USED TO TIE-OFF WIRE.




METAL EQUINE GATE

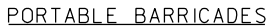


TIE BAR MOUNTING DETAIL  
FOR GATE CLOSERS



SECTION A-A  
CENTER CONCRETE DIG BARRIER APRON UNDER CLOSED GATE

DETAILED DRAWING	
REFERENCE STANDARD SPEC. SECTION 607	DWG. NO. 607-50
WILDLIFE FENCE	
EFFECTIVE: APRIL 2006	
 serving you with pride	MONTANA DEPARTMENT OF TRANSPORTATION



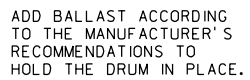
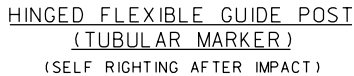
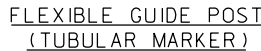
### PORTABLE BARRICADE NOTES:

- ① RAIL STRIPES ARE 6" IN WIDTH FOR BARRICADES 3' OR GREATER IN LENGTH. FOR BARRICADES LESS THAN 3' IN LENGTH, 4' STRIPES MAY BE USED.
- ② THE PREDOMINANT COLOR FOR OTHER BARRICADE COMPONENTS IS WHITE, BUT UNPAINTED GALVANIZED METAL OR ALUMINUM COMPONENTS MAY BE USED.
- ③ WHERE B(III) BARRICADES ARE TO FACE TRAFFIC FROM TWO DIRECTIONS, STRIPING ON BOTH THE FRONT AND REAR SIDES IS REQUIRED.
- ④ USE MATERIALS FOR BARRICADE FRAMEWORK AND ASSEMBLY, INCLUDING ANY SIGNS AND MEANS OF ATTACHMENT, THAT MEET THE REQUIREMENTS FOR NCHRP 350 FOR WORK ZONE DEVICES. ALTERNATIVELY, SIGNS AND BARRICADES MAY BE MOUNTED DIRECTLY BEHIND BARRICADES ON SEPARATE SIGN SUPPORTS.
- ⑤ USE SANDBAGS OF SUFFICIENT WEIGHT TO HOLD THE BARRICADES IN PLACE. WATERPROOF SANDBAGS DURING PERIODS OF FREEZING WEATHER.
- ⑥ BARRICADES DESIGNATED "R" ARE PLACED TO THE RIGHT SIDE OF APPROACHING TRAFFIC. THOSE DESIGNATED "L" ARE PLACED TO THE LEFT SIDE.
- ⑦ USE RETRO-REFLECTIVE SHEETING AS PER THE CONTRACT.



TYPE 2 OBJECT MARKER NOTES:

- ① USE TYPE 2 OBJECT MARKERS TO DELINEATE ROADSIDE CONSTRUCTIONS OF THE CLEAR ZONE. (I.e. DROP OFFS, OBSTACLES, ABRUPT CHANGES IN ROADWAY ALIGNMENT, ETC.)
  - ② DO NOT USE TYPE 2 OBJECT MARKERS AS CHANNELIZING DEVICES.
  - ③ ATTACH PANELS TO POSTS AT BOTH TOP AND BOTTOM HOLE LOCATIONS.
  - ④ USE RETRO-REFLECTIVE SHEETING AS PER THE CONTRACT.
- \* REDUCE OR ELIMINATE THE 2' - 0" DISTANCE WHEN OBSTACLE OR HAZARD IS LESS THAN 2' - 0" FROM THE EDGE OF THE DRIVING LANE.



DRUMS HAVE CLOSED TOPS.

PLASTIC DRUM




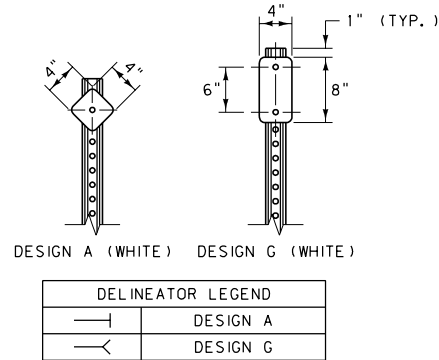
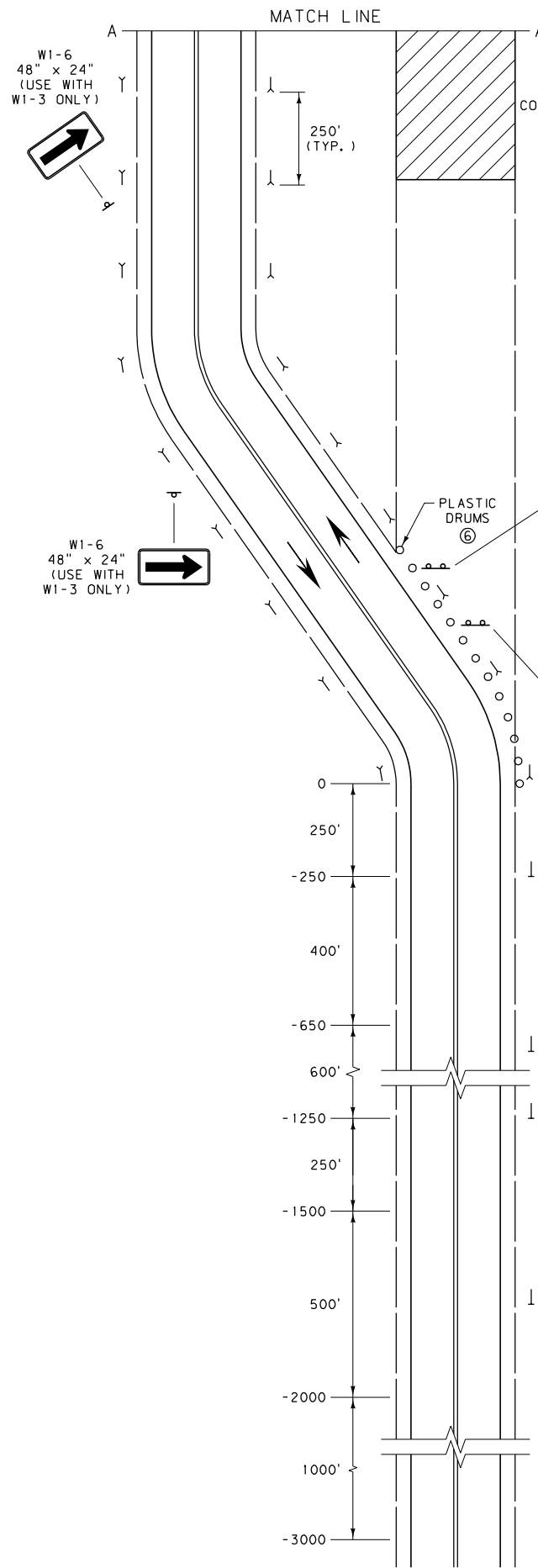
PORTABLE VERTICAL PANEL NOTES:

- ① USE PORTABLE VERTICAL PANELS AS CHANNELIZING DEVICES ONLY. DO NOT USE PORTABLE VERTICAL PANELS TO DELINEATE ROADSIDE CONSTRUCTIONS OF THE CLEAR ZONE.
- ② VERTICAL PANELS DESIGNATED "R" ARE PLACED TO THE RIGHT SIDE OF APPROACHING TRAFFIC. THOSE DESIGNATED "L" ARE PLACED TO THE LEFT SIDE.
- ③ USE RETRO-REFLECTIVE SHEETING AS PER THE CONTRACT.

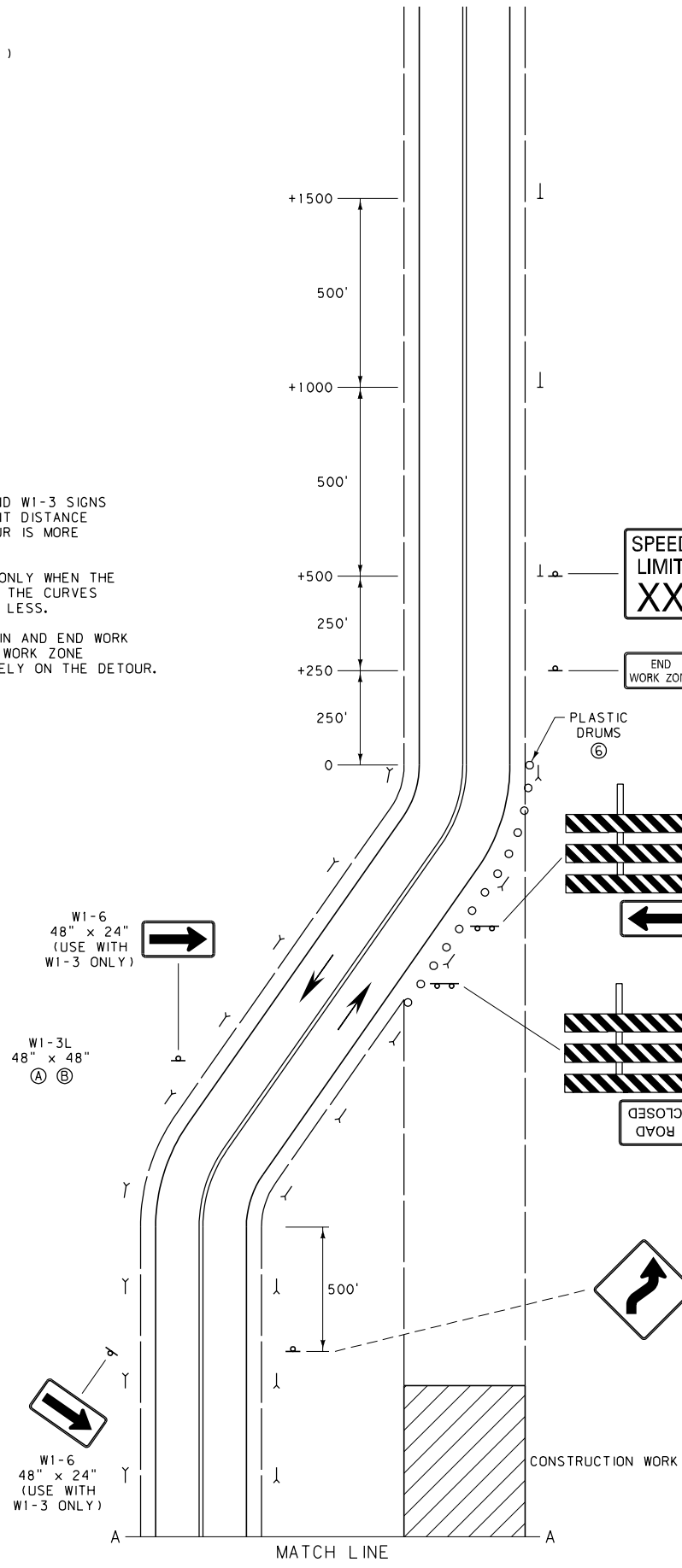
GENERAL NOTES:

- ① SEE THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) PART 6 FOR ADDITIONAL INFORMATION.

DETAILED DRAWING	
REFERENCE STANDARD SPEC. SECTION 618	DWG. NO. 618-00
BARRICADES, CHANNELIZING DEVICES AND OBJECT MARKERS	
EFFECTIVE: APRIL 2006	
 serving you with pride	MONTANA DEPARTMENT OF TRANSPORTATION

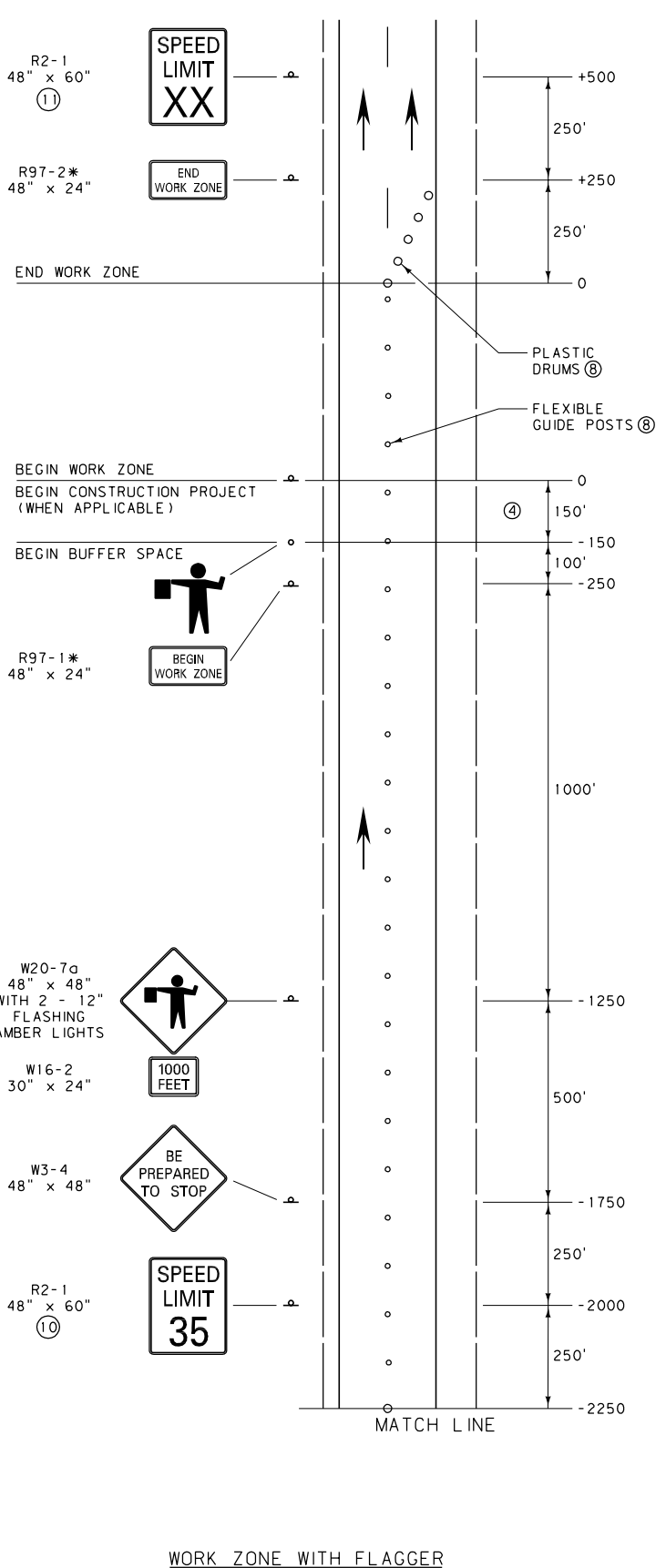
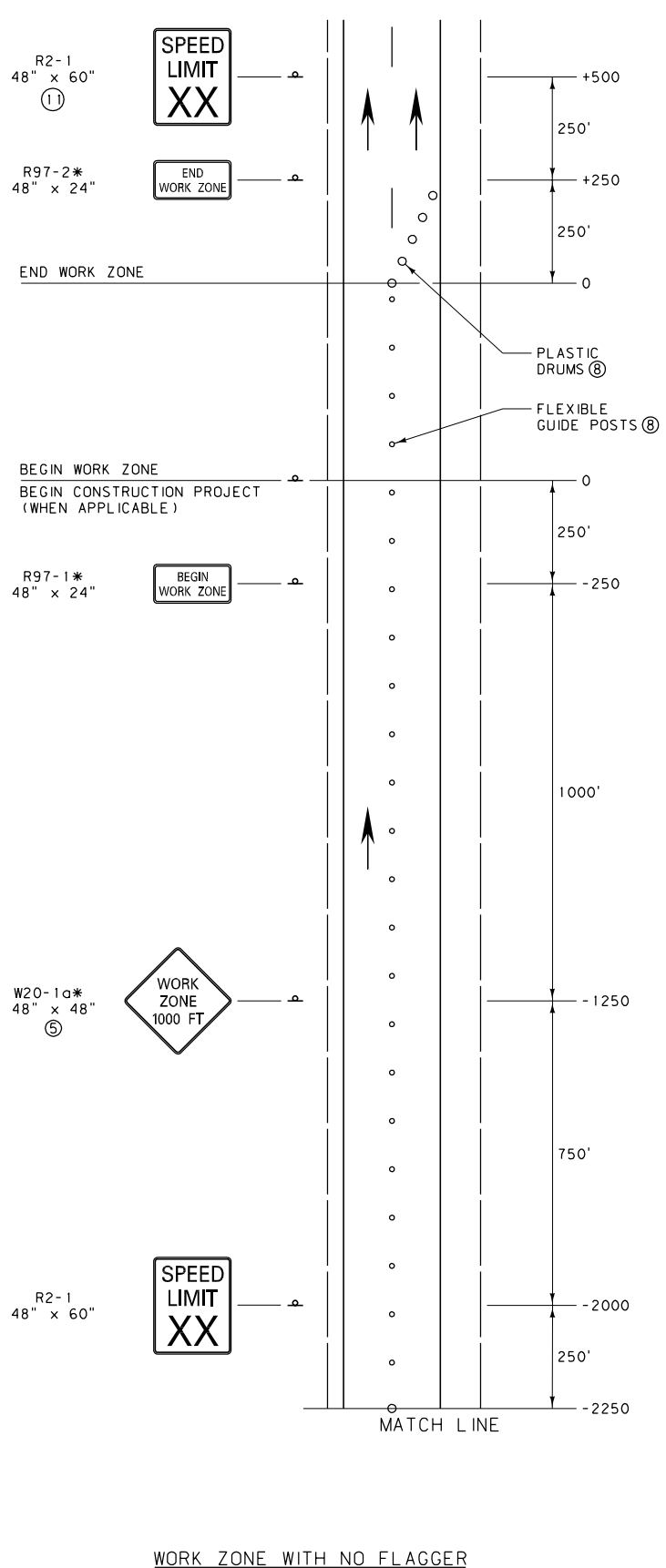
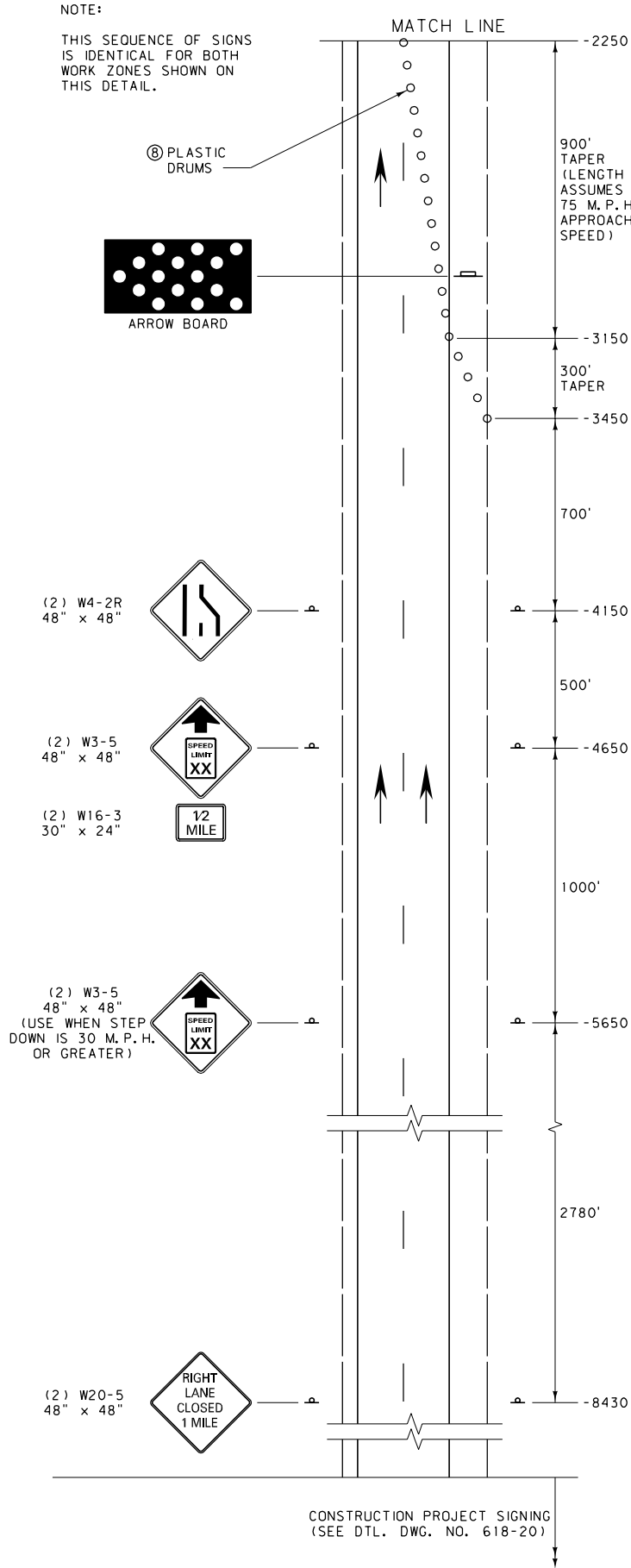


- Ⓐ USE THE W1-4 AND W1-3 SIGNS WHEN THE TANGENT DISTANCE ALONG THE DETOUR IS MORE THAN 600'.
- Ⓑ USE W1-3 SIGNS ONLY WHEN THE DESIGN SPEED OF THE CURVES IS 30 M.P.H. OR LESS.
- Ⓒ INCLUDE THE BEGIN AND END WORK ZONE SIGNS IF A WORK ZONE OCCURS EXCLUSIVELY ON THE DETOUR.




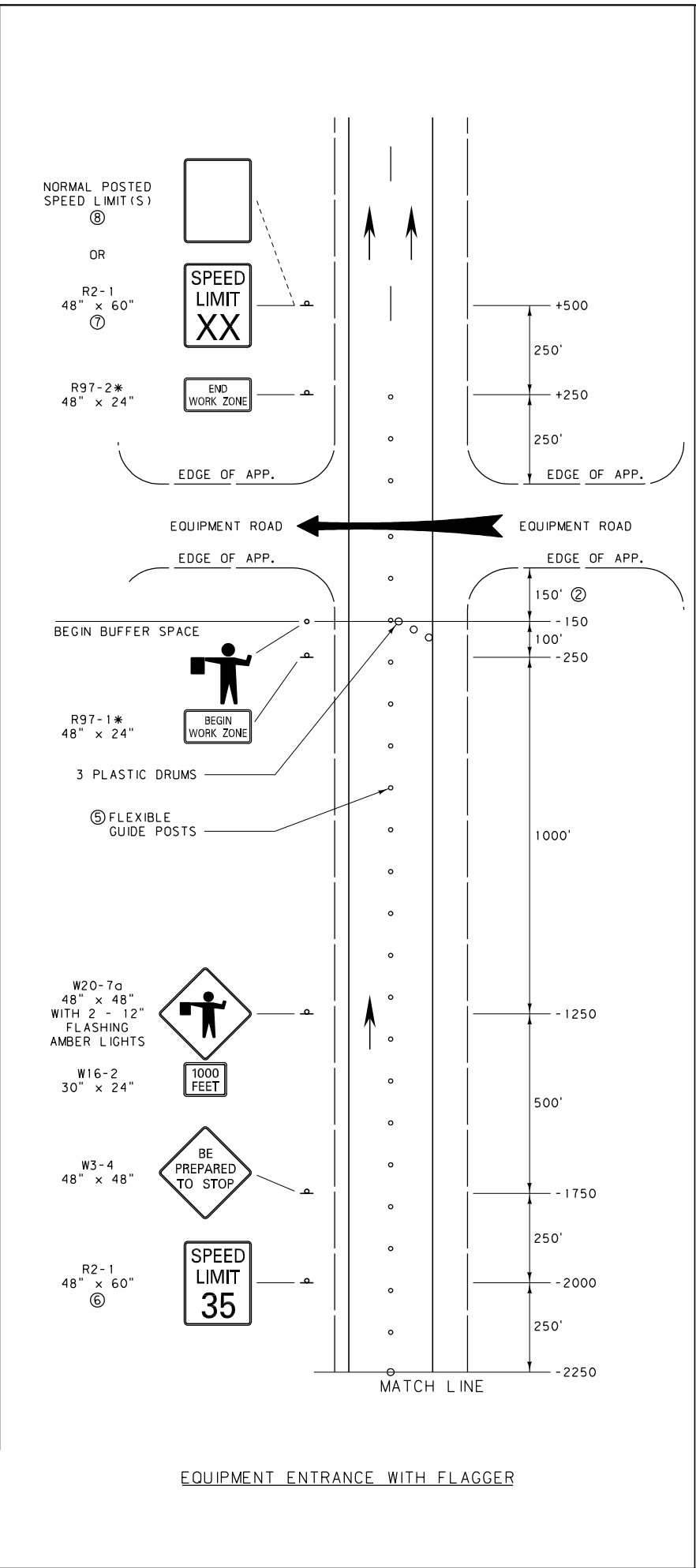
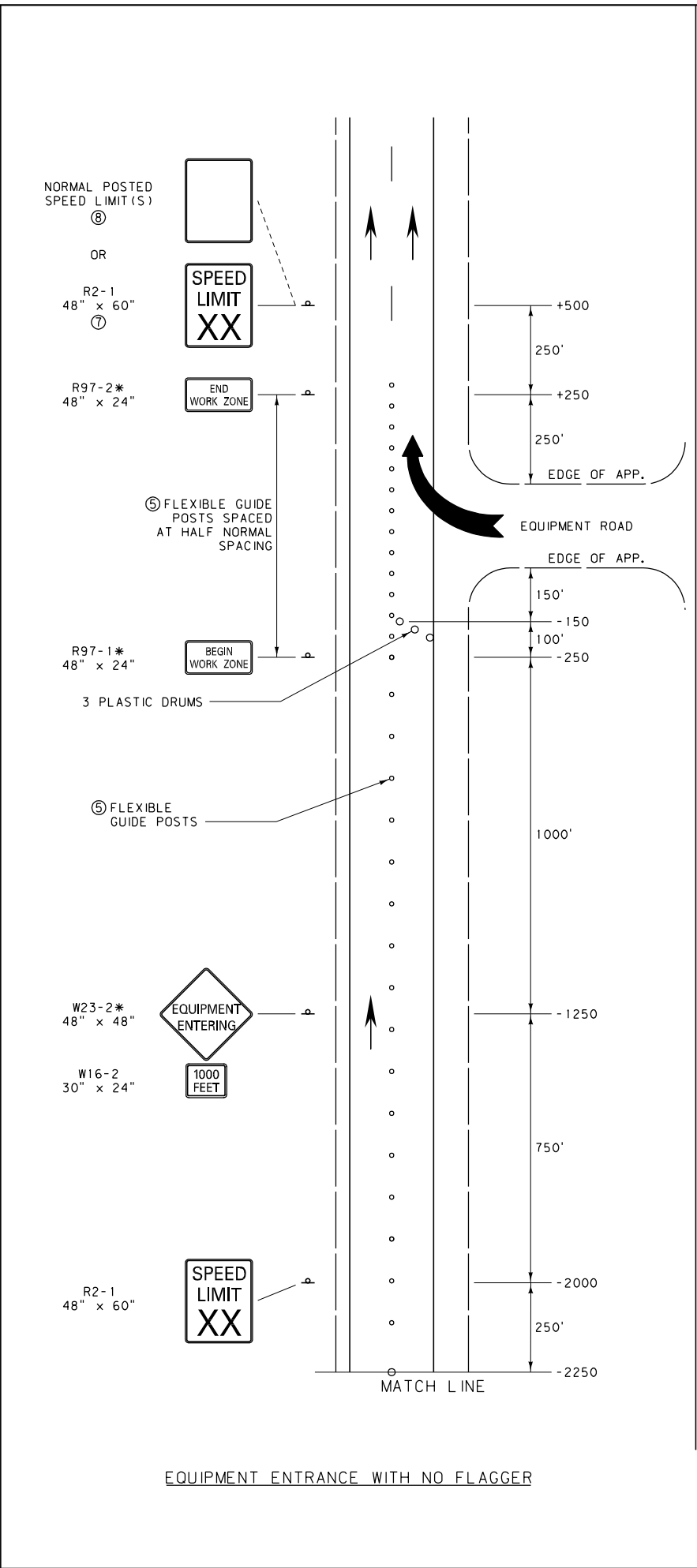
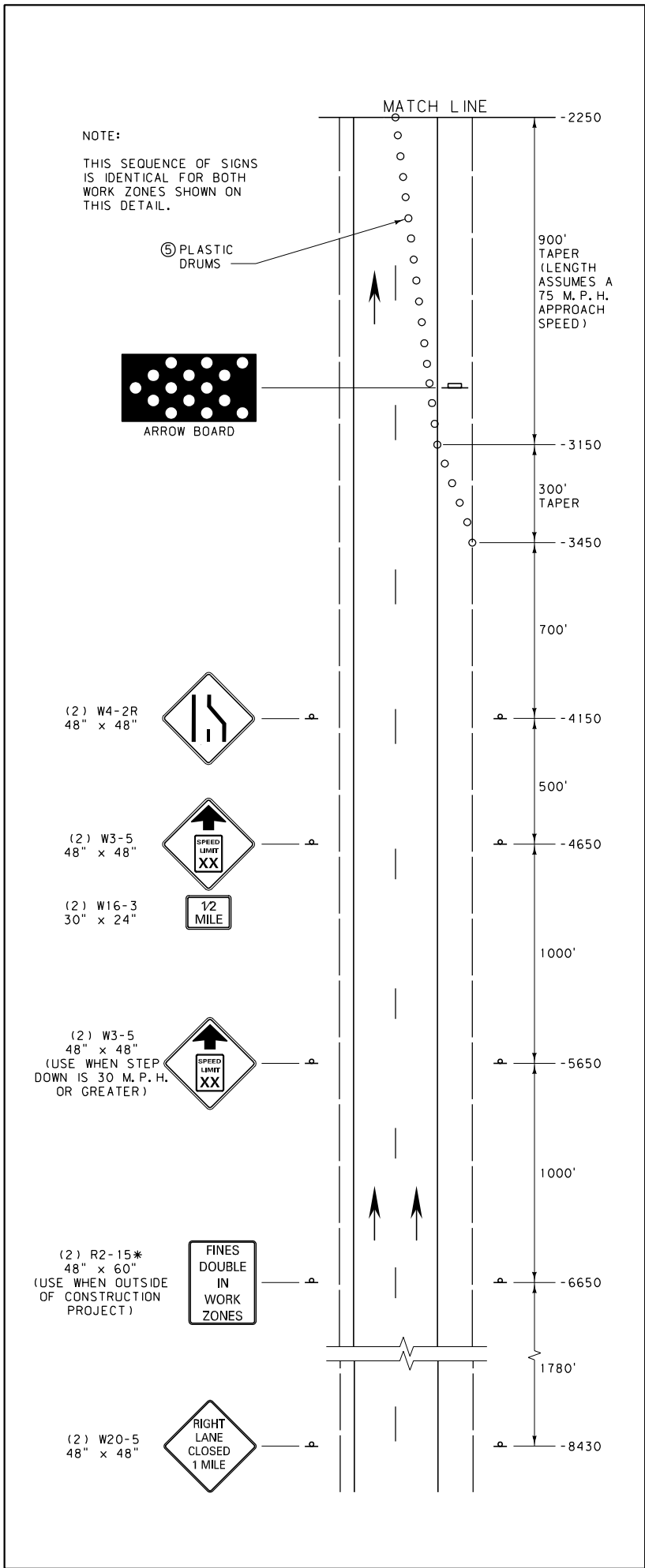
- NOTES:
- 1 INCLUDE REGULATORY SIGNING ONLY IF THERE IS REASON TO RESTRICT SPEED. MODIFY REGULATORY SIGNS TO MATCH ADJACENT REGULATIONS.
  - 2 SET UP THIS SIGN LAYOUT IN EACH TRAFFIC DIRECTION.
  - 3 PAVED DETOURS 24 FEET WIDE OR GREATER HAVE 4 INCH WHITE SHOULDER STRIPES AND APPROPRIATE CENTERLINE STRIPES.
  - 4 UNPAVED DETOURS MAY REQUIRE ADDITIONAL DELINEATION.
  - 5 USE ONLY POST MOUNTED SIGNS. DO NOT USE PORTABLE SIGN MOUNTS.
  - 6 PLACE PLASTIC DRUMS AT INTERVALS IN FEET OF NO MORE THAN ONE TIMES THE SPEED LIMIT IN M.P.H. OR AS DIRECTED BY THE ENGINEER FOR SPEEDS LESS THAN 35 M.P.H.
  - 7 XX = SPEED DETERMINED BY THE DETOUR DESIGN SPEED OR THE ENGINEER.
  - 8 THE WORK ZONE REFERS TO THE AREA WITHIN THE CONSTRUCTION PROJECT WHERE WORK IS ACTUALLY TAKING PLACE.
  - 9 USE MATERIALS FOR BARRICADE FRAMEWORK AND ASSEMBLY, INCLUDING ANY SIGNS AND MEANS OF ATTACHMENT, THAT MEET THE REQUIREMENTS FOR NCHRP 350 FOR WORK ZONE DEVICES. ALTERNATIVELY, SIGNS ON BARRICADES MAY BE MOUNTED DIRECTLY BEHIND BARRICADES ON SEPARATE SIGN SUPPORTS.
  - 10 POST THE END OF WORK ZONE SPEED LIMIT APPROPRIATE FOR ALL VEHICLES FOR THE REMAINDER OF THE CONSTRUCTION PROJECT BEFORE RESUMING TO NORMAL POSTED SPEED LIMITS AT THE END OF THE CONSTRUCTION PROJECT.
- \* DENOTES SIGNS THAT ARE UNIQUE TO MONTANA.

NOTE:  
THIS SEQUENCE OF SIGNS  
IS IDENTICAL FOR BOTH  
WORK ZONES SHOWN ON  
THIS DETAIL.



- NOTES:
- ① THESE SIGN LAYOUTS WORK IN CONJUNCTION WITH THE PERMANENT LAYOUT ILLUSTRATED ON DTL. DWG. NO. 618-20 FOR WORK ZONES LOCATED AT THE BEGIN AND END OF THE CONSTRUCTION PROJECT.
  - ② INCLUDE REGULATORY SIGNING ONLY IF THERE IS REASON TO RESTRICT SPEED WITHIN THE WORK ZONE. MODIFY REGULATORY SIGNS TO MATCH ADJACENT REGULATIONS.
  - ③ THE WORK ZONE REFERS TO THE AREA WITHIN THE CONSTRUCTION PROJECT WHERE WORK IS ACTUALLY TAKING PLACE.
  - ④ THE BUFFER SPACE MAY BE INCREASED FOR DOWNGRADES AND OTHER CONDITIONS THAT AFFECT STOPPING DISTANCE.
  - ⑤ USE MORE SPECIFIC SIGNS, WHERE APPLICABLE, SUCH AS W8-3 "PAVEMENT ENDS."
  - ⑥ XX = SPEED DETERMINED BY THE ENGINEER.
  - ⑦ PROVIDE A SECOND FLAGGER WHEN REQUIRED BY STANDARD SPECIFICATIONS, SECTION 618.
  - ⑧ SPACE FLEXIBLE GUIDE POSTS ON TANGENTS AT INTERVALS IN FEET OF NO MORE THAN TWO TIMES THE SPEED LIMIT IN M. P. H. SPACE PLASTIC DRUMS IN ALL TAPER SECTIONS AT INTERVALS IN FEET OF NO MORE THAN ONE TIMES THE SPEED LIMIT IN M. P. H. FOR SPEED LIMITS LESS THAN 35 M. P. H., SPACE CHANNELIZING DEVICES AS DIRECTED BY THE ENGINEER.
  - ⑨ WHEN PORTABLE SIGNS ARE USED, PLACE AS DIRECTED BY THE ENGINEER.
  - ⑩ IF FLAGGER IS MORE THAN ONE MILE FROM THE LANE CLOSURE, INCLUDE W3-5 SIGNS, AS REQUIRED.
  - ⑪ POST THE END OF WORK ZONE SPEED LIMIT APPROPRIATE FOR ALL VEHICLES FOR THE REMAINDER OF THE CONSTRUCTION PROJECT BEFORE RESUMING TO NORMAL POSTED SPEED LIMITS AT THE END OF THE CONSTRUCTION PROJECT.
- \* DENOTES SIGNS THAT ARE UNIQUE TO MONTANA.

DETAILED DRAWING	
REFERENCE	DWG. NO.
STANDARD SPEC.	618-24
SECTION 618	
DIVIDED FOUR-LANE CONSTRUCTION PROJECT WORK ZONES	
EFFECTIVE: APRIL 2006	
	MONTANA DEPARTMENT OF TRANSPORTATION



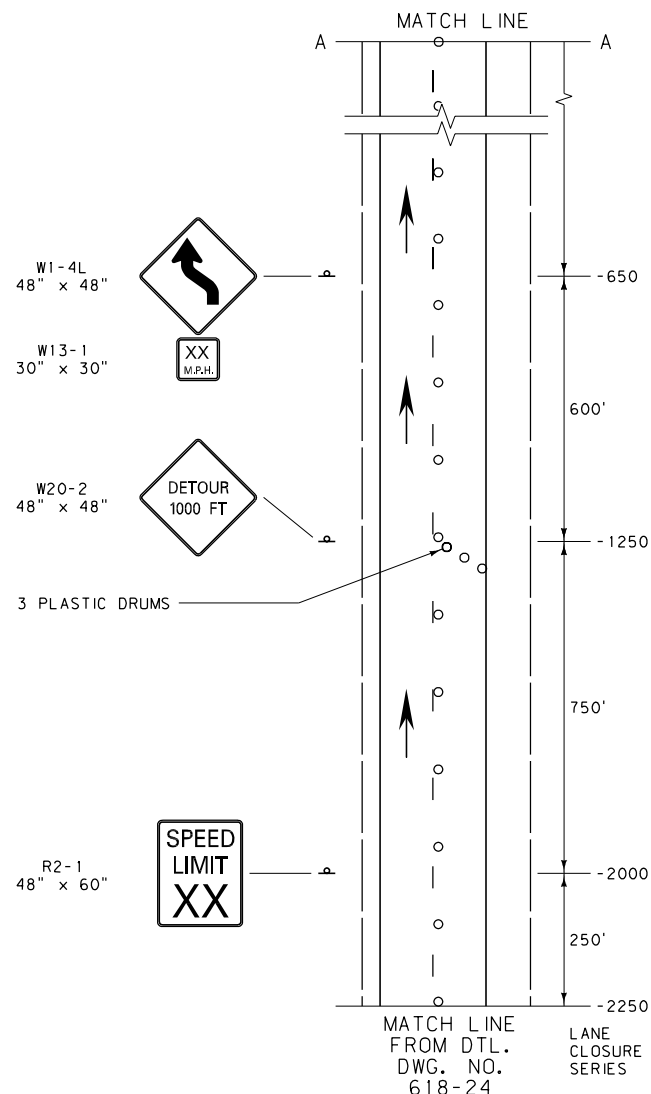
NOTES:

- ① INCLUDE REGULATORY SIGNING ONLY IF THERE IS REASON TO RESTRICT SPEED WITHIN THE WORK ZONE. MODIFY REGULATORY SIGNS TO MATCH ADJACENT REGULATIONS.
- ② THE BUFFER SPACE MAY BE INCREASED FOR DOWNGRADES AND OTHER CONDITIONS THAT AFFECT STOPPING DISTANCE.
- ③ XX = SPEED DETERMINED BY THE ENGINEER.
- ④ THE WORK ZONE REFERS TO THE AREA WHERE WORK IS ACTUALLY TAKING PLACE. WHEN THIS OCCURS OUTSIDE OF A CONSTRUCTION PROJECT, INCLUDE THE R2-15\* SIGN.
- ⑤ SPACE FLEXIBLE GUIDE POSTS ON TANGENTS AT INTERVALS IN FEET OF NO MORE THAN TWO TIMES THE SPEED LIMIT IN M.P.H. SPACE PLASTIC DRUMS IN ALL TAPER SECTIONS AT INTERVALS IN FEET OF NO MORE THAN ONE TIMES THE SPEED LIMIT IN M.P.H. FOR SPEED LIMITS LESS THAN 35 M.P.H., SPACE CHANNELIZING DEVICES AS DIRECTED BY THE ENGINEER.
- ⑥ IF FLAGGER IS MORE THAN ONE MILE FROM THE LANE CLOSURE, INCLUDE W3-5 SIGNS, AS REQUIRED.
- ⑦ POST THE END OF WORK ZONE SPEED LIMIT APPROPRIATE FOR ALL VEHICLES FOR THE REMAINDER OF THE CONSTRUCTION PROJECT BEFORE RESUMING TO NORMAL POSTED SPEED LIMITS AT THE END OF THE CONSTRUCTION PROJECT.
- ⑧ WHEN OUTSIDE OF A CONSTRUCTION PROJECT, POST THE SPEED LIMIT CONSISTING OF ONE LIMIT WHEN THE NORMAL POSTED SPEED LIMIT FOR ALL VEHICLES IS THE SAME. WHEN CAR AND TRUCK SPEED LIMITS DIFFER, POST BOTH LIMITS ON A SINGLE SIGN.

\* DENOTES SIGNS THAT ARE UNIQUE TO MONTANA.

DETAILED DRAWING	
REFERENCE STANDARD SPEC. SECTION 618	DWG. NO. 618-27
DIVIDED FOUR-LANE EQUIPMENT ENTRANCES	
EFFECTIVE: APRIL 2006	
MONTANA DEPARTMENT OF TRANSPORTATION serving you with pride	



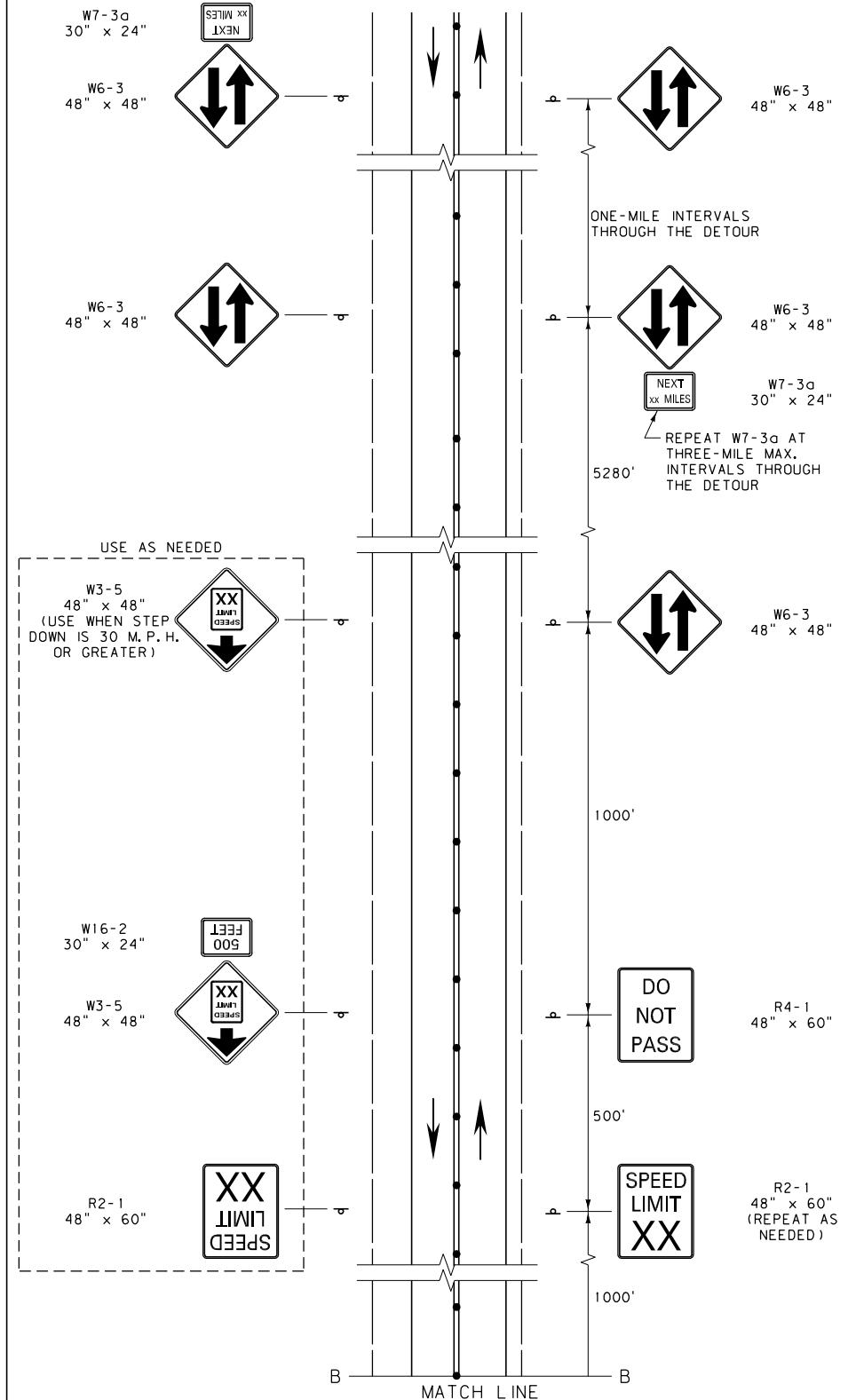
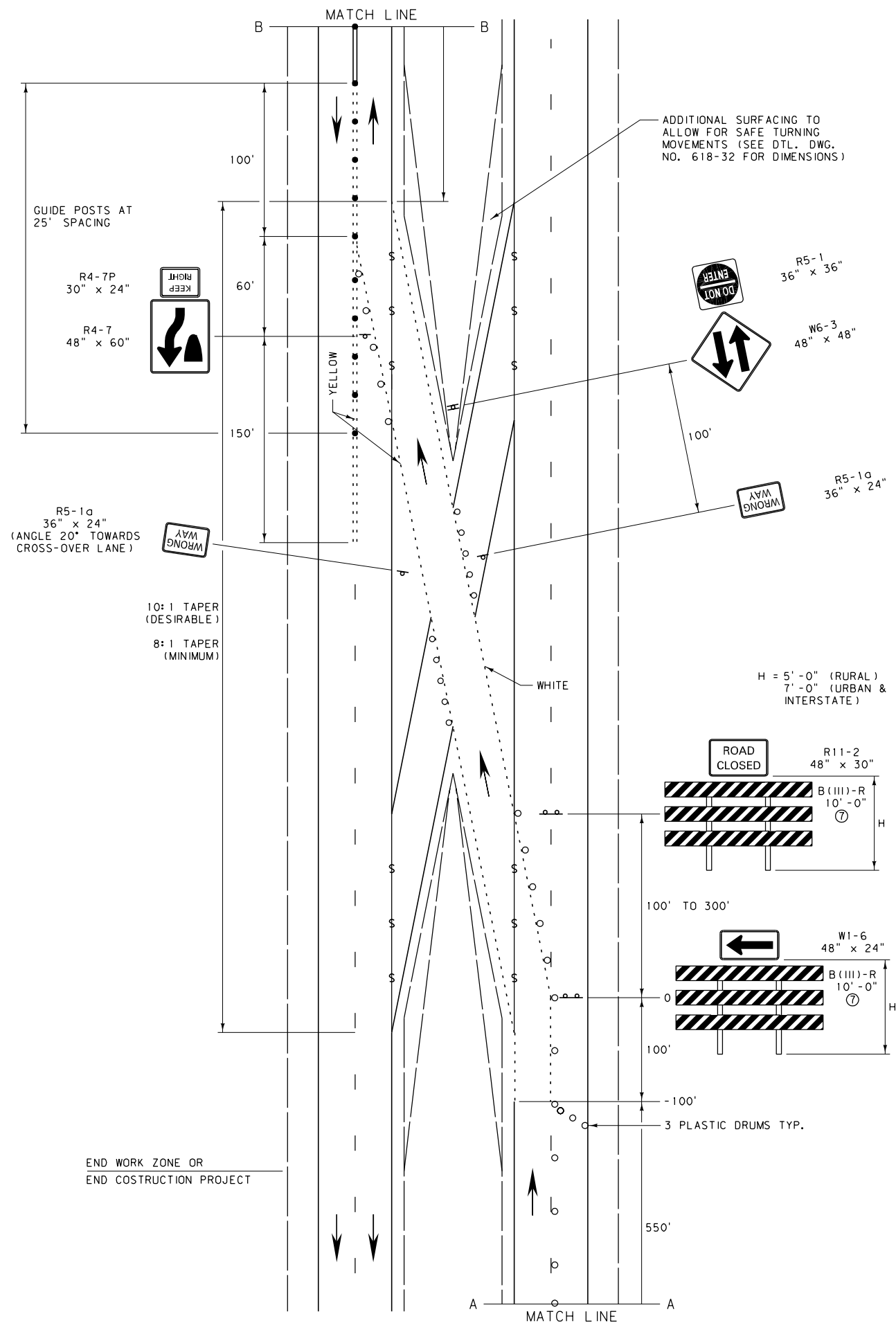


#### LEGEND

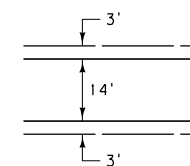
- OBLITERATE CONFLICTING PAVEMENT MARKINGS AND FILL ANY EXISTING RUMBLE STRIPS WITH PMS
- PLASTIC DRUMS (SEE NOTES FOR SPACING)
- RAISED RIGID PAVEMENT MARKERS TYPE I OR II AT 5' SPACING
- ==== DOUBLE YELLOW PAINT OR DOUBLE PLASTIC PAVEMENT MARKING TABS AT 5' SPACING
- FLEXIBLE GLUE-DOWN GUIDE POSTS ON TWO-LANE (SEE NOTES FOR SPACING EXCEPT AS SHOWN)


#### NOTES:

- ① INCLUDE REGULATORY SIGNING ONLY AS REQUIRED. MODIFY REGULATORY SIGNS TO MATCH ADJACENT REGULATIONS.
- ② THE WORK ZONE REFERS TO THE AREA WITHIN THE CONSTRUCTION PROJECT WHERE WORK IS ACTUALLY TAKING PLACE.
- ③ INDICATED SPACINGS ARE INTENDED TO BE A MAXIMUM AND MAY BE REDUCED IF CONDITIONS WARRANT.
- ④ XX = SPEED DETERMINED BY THE MEDIAN CROSSING DESIGN SPEED OR THE ENGINEER.
- ⑤ SPACE CHANNELIZING DEVICES ON TANGENTS AT INTERVALS IN FEET OF NO MORE THAN TWO TIMES THE SPEED LIMIT IN M.P.H. AND ON ALL TAPER SECTIONS AT INTERVALS IN FEET OF NO MORE THAN ONE TIMES THE SPEED LIMIT IN M.P.H. FOR SPEED LIMITS LESS THAN 35 M.P.H., SPACE CHANNELIZING DEVICES AS DIRECTED BY THE ENGINEER.
- ⑥ OBLITERATE ALL PAVEMENT MARKINGS THAT CONFLICT AT ANY TIME DURING OR AFTER MEDIAN CROSSING USE.
- ⑦ USE MATERIALS FOR BARRICADE FRAMEWORK AND ASSEMBLY, INCLUDING ANY SIGNS AND MEANS OF ATTACHMENT, THAT MEET THE REQUIREMENTS FOR NCHRP 350 FOR WORK ZONE DEVICES. ALTERNATIVELY, SIGNS ON BARRICADES MAY BE MOUNTED DIRECTLY BEHIND BARRICADES ON SEPARATE SIGN SUPPORTS.



#### TYP. CROSS-OVER SECTION



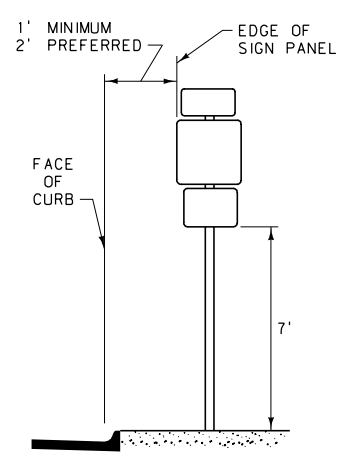
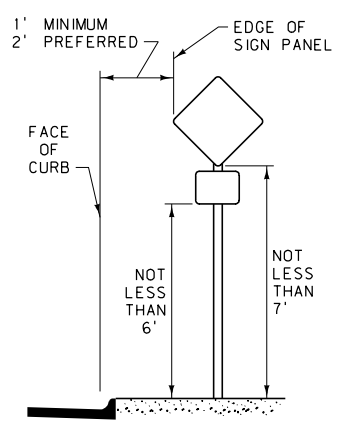
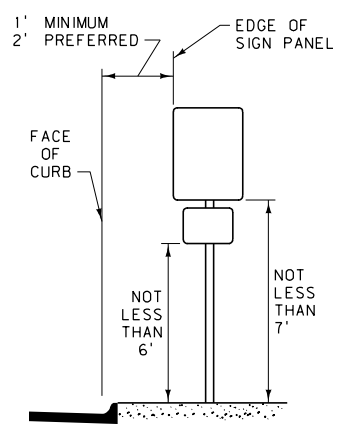
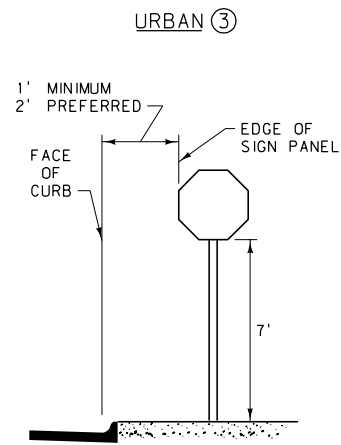
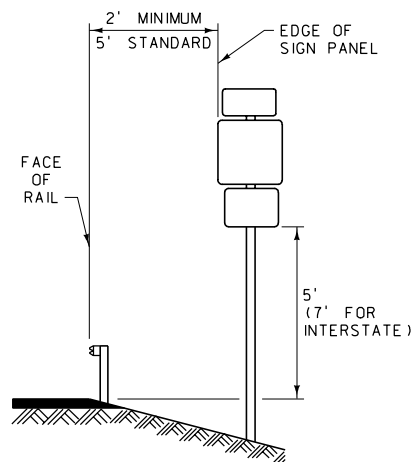
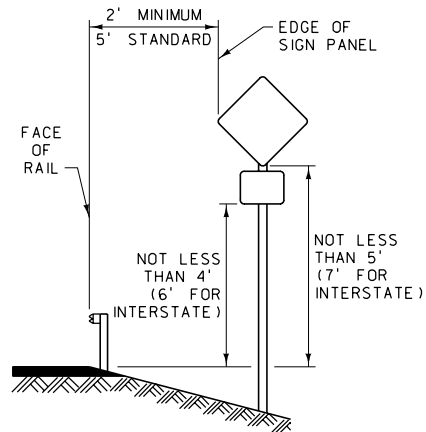
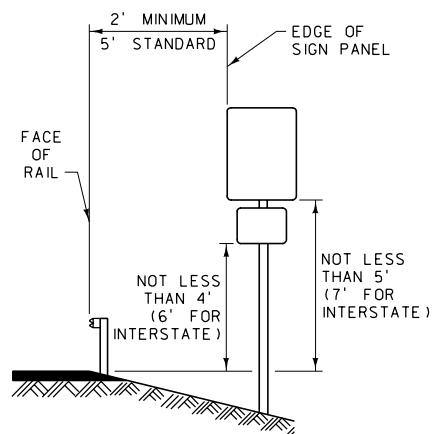
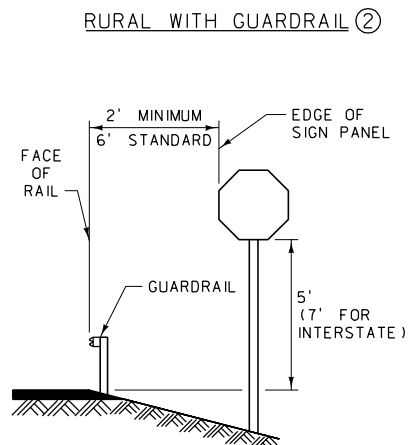
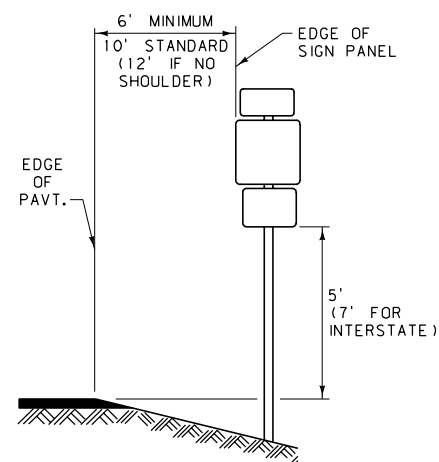
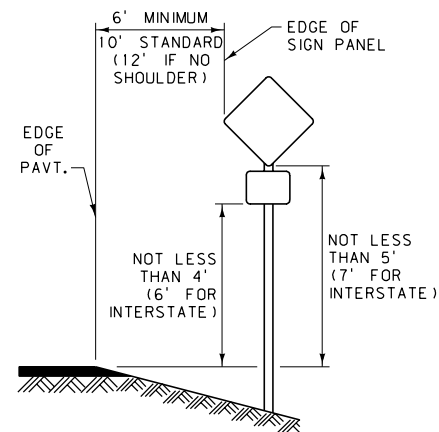
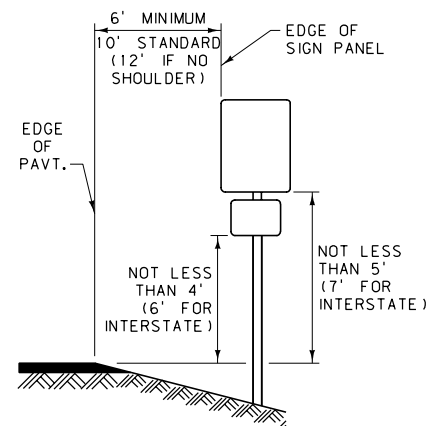
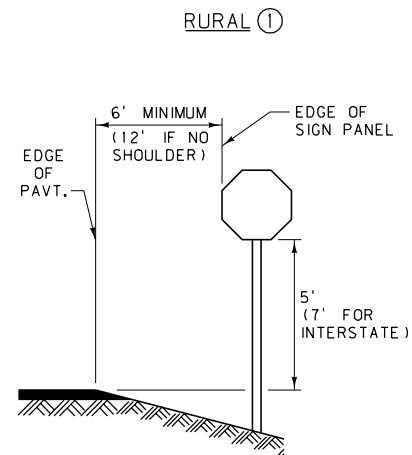
DETAILED DRAWING	
REFERENCE	DWG. NO.
STANDARD SPEC.	618-30
SECTION 618	
TEMPORARY FOUR-LANE TO TWO-LANE MEDIAN CROSSING	
EFFECTIVE: APRIL 2006	
 MONTANA DEPARTMENT OF TRANSPORTATION	



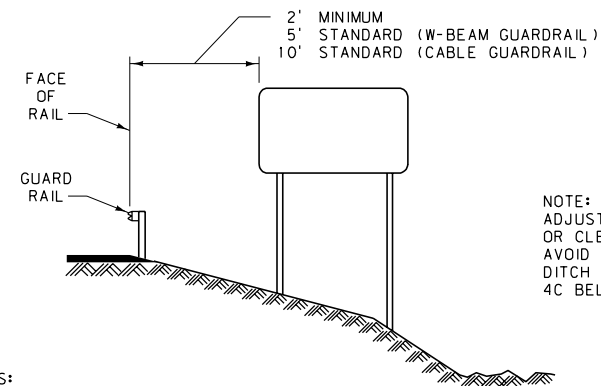
REGULATORY  
EXCEPT R1-1 / R1-2

WARNING

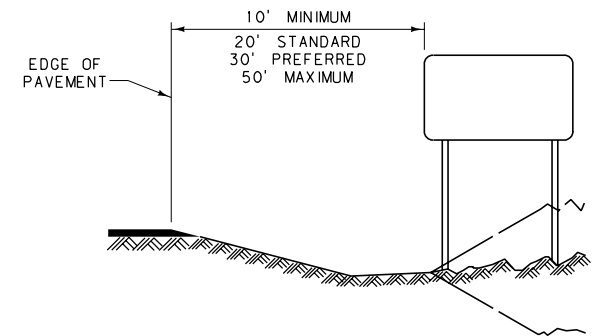
## ROUTE MARKERS



## GUIDE SIGNS



NOTE:  
ADJUST SIGN LOCATION  
OR CLEARANCE SLIGHTLY TO  
AVOID PLACING POSTS IN  
DITCH BOTTOMS. SEE NOTE  
4C BELOW.



- NOTES:

- |  |   |
|--|---|
| 1. PLACE ALL SIGNS AT THE CLEARANCE AND MOUNTING HEIGHTS SHOWN.  | B) FOR PLACEMENT OF THESE SIGNS IN URBAN CONDITIONS, SEE THE SIGN LOCATION AND SPECIFICATION SHEETS IN THE SIGNING PLANS FOR EACH INDIVIDUAL SIGN.  |
| 2. FOR REGULATORY, WARNING AND ROUTE MARKER SIGNS, AND THEIR ASSEMBLIES, ON HIGHWAYS OTHER THAN INTERSTATE:<br>A) USE DIAGRAMS LOCATED IN COLUMN ① WHEN PLACING THESE SIGNS IN STANDARD RURAL CONDITIONS. USE COLUMN ② WHEN PLACING THESE SIGNS BEHIND GUARDRAIL IN RURAL CONDITIONS. USE COLUMN ③ WHEN PLACING THESE SIGNS IN URBAN CONDITIONS WHERE THERE IS ADEQUATE CLEARANCE AND SIDEWALK WIDTH.<br>B) WHERE SIDEWALK WIDTH IS LIMITED IN URBAN CONDITIONS, SEE DTL. DWG. NO. 619-18 FOR PLACEMENT DETAILS. | C) THE MAXIMUM CLEARANCE OF THESE SIGNS IS 50' IN ANY CONDITION.<br>D) SEE DTL. DWG. NO. 619-08 FOR MOUNTING HEIGHTS.   |
| 3. FOR REGULATORY (ALL OTHER), WARNING AND ROUTE MARKER SIGNS, AND THEIR ASSEMBLIES, ON INTERSTATE HIGHWAYS:<br>THE CLEARANCE IS 20' FROM THE EDGE OF PAVEMENT IN COLUMN ① FOR STANDARD RURAL CONDITIONS. THE CLEARANCES LISTED IN COLUMNS ② AND ③ REMAIN AS SHOWN.  | 5. WITHIN THE CITY LIMITS OR IN A SIDEWALK AND CURB AREA, MOUNT SIGNS TO HAVE THE PROPER CLEARANCES, BUT AVOID ANY CONFLICT BETWEEN THE POST AND THE MAIN WALKING AREA OF THE SIDEWALK, OR WITH DOORWAYS OR WINDOWS OF ADJACENT BUILDINGS. THE EXACT LOCATION OF THESE SIGN INSTALLATIONS WILL BE DETERMINED BY THE ENGINEER. SEE DTL. DWG. NO. 619-18 FOR VARIOUS CANTILEVER TYPE MOUNTINGS. |
| 4. FOR GUIDE SIGNS AND THEIR ASSEMBLIES:<br>A) USE THE DIAGRAMS LOCATED ABOVE WHEN PLACING THESE SIGNS IN THE GIVEN RURAL CONDITIONS.  | 6. EVALUATE SIGNS WITHIN CLEAR ZONES (TABLES BELOW) FOR SUPPORT BREAKAWAY REQUIREMENTS (CONTACT MDT TRAFFIC SECTION FOR CRITERIA).  |

CLEAR ZONE DISTANCES  
(IN FEET FROM EDGE OF DRIVING LANE)

DESIGN SPEED	DESIGN ADT	FILL SLOPES			CUT SLOPES		
		6:1 OR FLATTER	5:1 TO 4:1	3:1	3:1	4:1 TO 5:1	6:1 OR FLATTER
40 MPH OR LESS	UNDER 750	7-10	7-10	**	7-10	7-10	7-10
	750-1499	10-12	12-14	**	10-12	10-12	10-12
	1500-6000	12-14	14-16	**	12-14	12-14	12-14
	OVER 6000	14-16	16-18	**	14-16	14-16	14-16
45-50 MPH	UNDER 750	10-12	12-14	**	8-10	8-10	10-12
	750-1499	12-14	16-20	**	10-12	12-14	14-16
	1500-6000	16-18	20-26	**	12-14	14-16	16-18
	OVER 6000	18-20	24-28	**	14-16	18-20	20-22
55 MPH	UNDER 750	12-14	14-18	**	8-10	10-12	10-12
	750-1499	16-18	20-24	**	10-12	14-16	16-18
	1500-6000	20-22	24-30	**	14-16	16-18	20-22
	OVER 6000	22-24	26-32	**	16-18	20-22	22-24
60 MPH	UNDER 750	16-18	20-24	**	10-12	12-14	14-16
	750-1499	20-24	26-32	**	12-14	16-18	20-22
	1500-6000	26-30	32-40	**	14-18	18-22	24-26
	OVER 6000	30-32	36-44	**	20-22	24-26	26-28
65-70 MPH	UNDER 750	18-20	20-26	**	10-12	14-16	14-16
	750-1499	24-26	28-36	**	12-16	18-20	20-22
	1500-6000	28-32	34-42	**	16-20	22-24	26-28
	OVER 6000	30-34	38-46	**	22-24	26-30	28-30

\* WHEN AN INVESTIGATION OR ACCIDENT HISTORY INDICATES A HIGH PROBABILITY OF ACCIDENTS, CLEAR ZONE DISTANCES GREATER THAN 30' MAY BE PROVIDED AS INDICATED. CLEAR ZONES MAY ALSO BE LIMITED TO 30' TO PROVIDE A CONSISTENT ROADWAY TEMPLATE WHEN EXPERIENCE WITH PREVIOUS SIMILAR PROJECTS INDICATES SATISFACTORY PERFORMANCE.

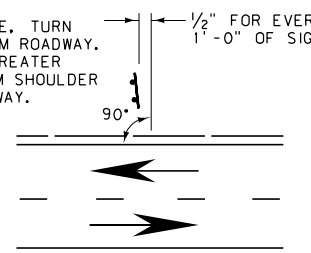
**\*\* FIXED OBJECTS, INCLUDING SIGN POSTS, SHOULD NOT BE ALLOWED IN THE VICINITY OF THE TOE OF THESE SLOPES. SEE AASHTO ROADSIDE DESIGN GUIDE FOR ADDITIONAL CONSIDERATIONS IN LOCATING SIGNS.**

HORIZONTAL CURVE ADJUSTMENTS  
(APPLICABLE ON OUTSIDE OF CURVE ONLY)



RADIUS (FT)	DESIGN SPEED (MPH)						
	40	45	50	55	60	65	70
2860	1.1	1.1	1.1	1.2	1.2	1.2	1.3
2290	1.1	1.1	1.2	1.2	1.2	1.3	1.3
1910	1.1	1.2	1.2	1.2	1.3	1.3	1.4
1640	1.1	1.2	1.2	1.3	1.3	1.4	1.5
1430	1.2	1.2	1.3	1.3	1.4	1.4	
1270	1.2	1.2	1.3	1.3	1.4	1.5	
1150	1.2	1.2	1.3	1.4	1.5		
950	1.2	1.3	1.4	1.5	1.5		
820	1.3	1.3	1.4	1.5			
720	1.3	1.4	1.5				
640	1.3	1.4	1.5				
570	1.4	1.5					
380	1.5						

TO AVOID GLARE, TURN  
SIGN AWAY FROM ROADWAY.  
ANGLE SIGNS GREATER  
THAN 30' FROM SHOULDER  
TOWARDS ROADWAY.

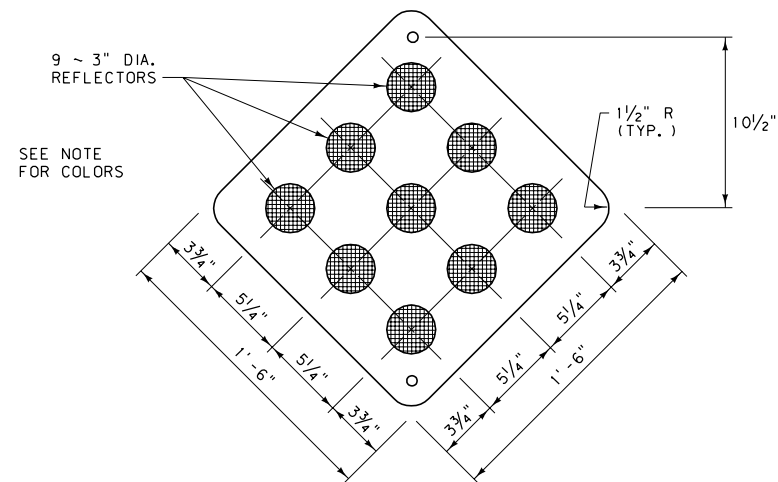
1/2" FOR EVERY  
1'-0" OF SIGN WIDTH



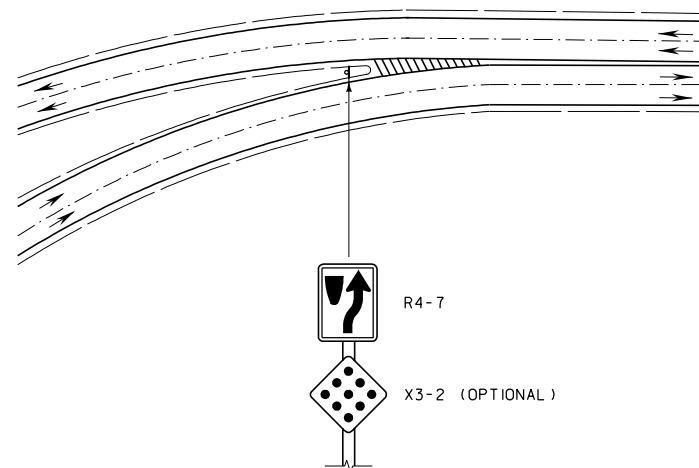
SKIEW DIAGRAM

<p align="center"><b>DETAILED DRAWING</b></p>	
<p>REFERENCE STANDARD SPEC. SECTION 619</p>	<p>DWG. NO. 619-00</p>
<p align="center">SIGN CLEARANCES AND MOUNTING HEIGHTS</p>	
<p>EFFECTIVE: APRIL 2006</p>	
 <p><i>serving you with pride</i></p>	<p>  <b>MONTANA DEPARTMENT OF TRANSPORTATION</b> </p>

TYPE 1  
X3-2



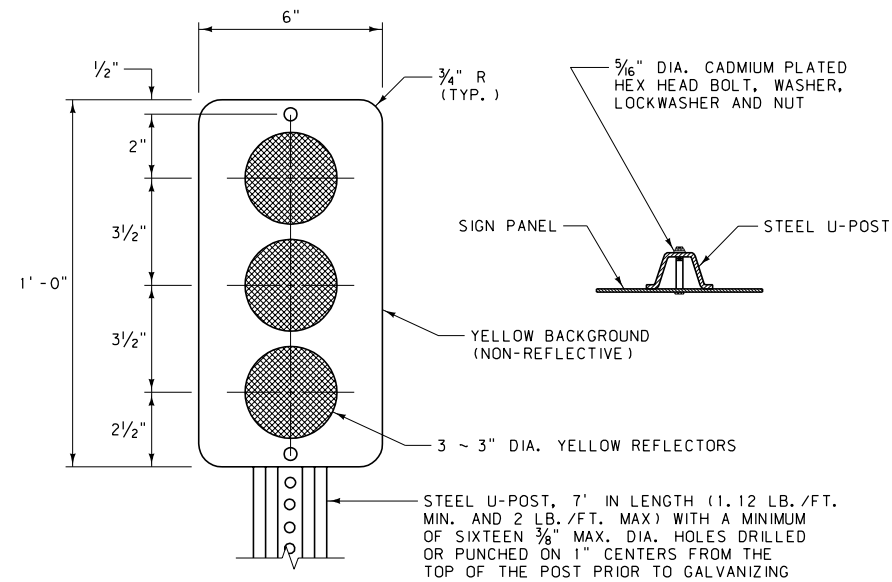
NOTE:  
TYPE 1 OBJECT MARKERS HAVE YELLOW REFLECTORS ON A YELLOW OR BLACK BACKGROUND OR AN ALL YELLOW RETRO-REFLECTORIZED PANEL OF THE SAME SIZE. IF USED AS END OF ROAD MARKERS, TYPE 1 MARKERS ARE RETRO-REFLECTORIZED RED OR HAVE RED REFLECTORS ON A RED OR BLACK BACKGROUND.



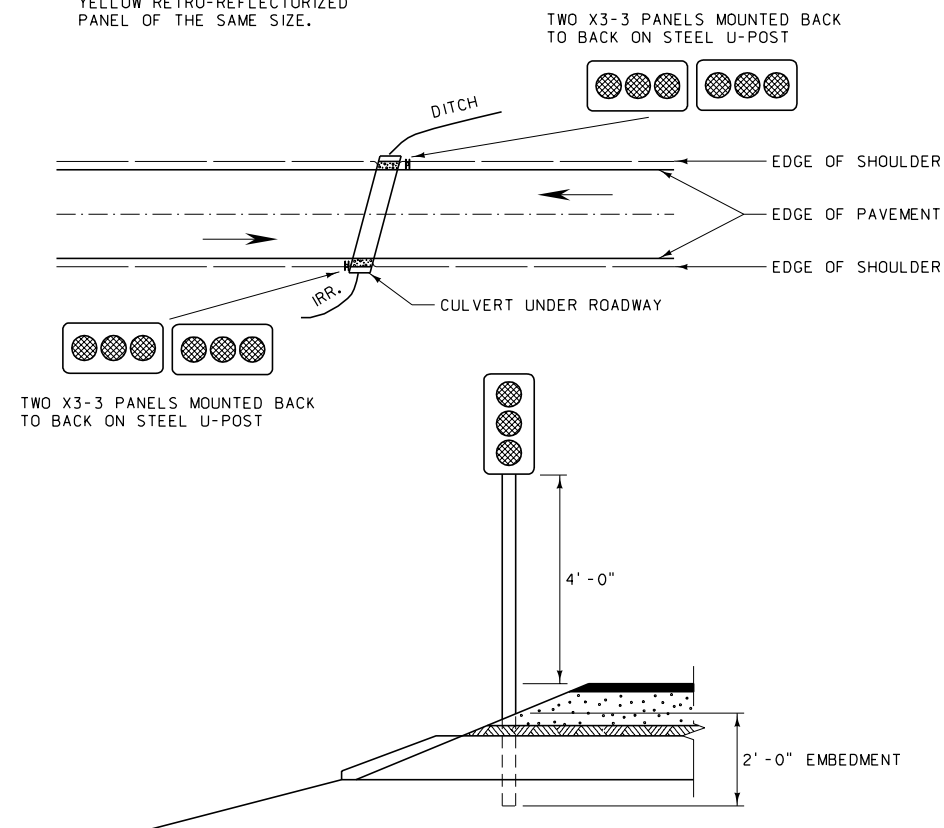
#### TYPICAL USE AND PLACEMENT

PLACEMENT OF X3-2 IS USED ONLY AS OPTIONAL TO ENHANCE TARGET VALUE WHEN NEEDED.

TYPE 2  
X3-3



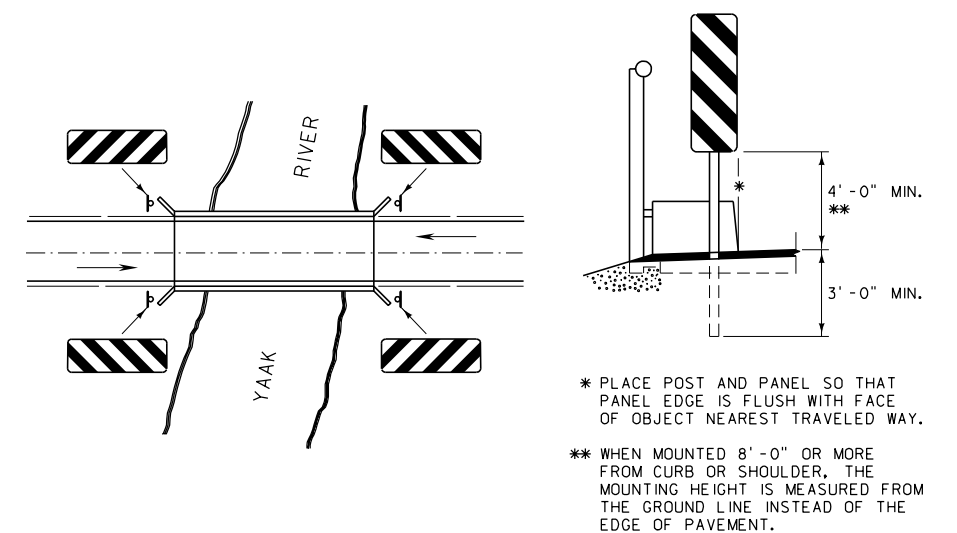
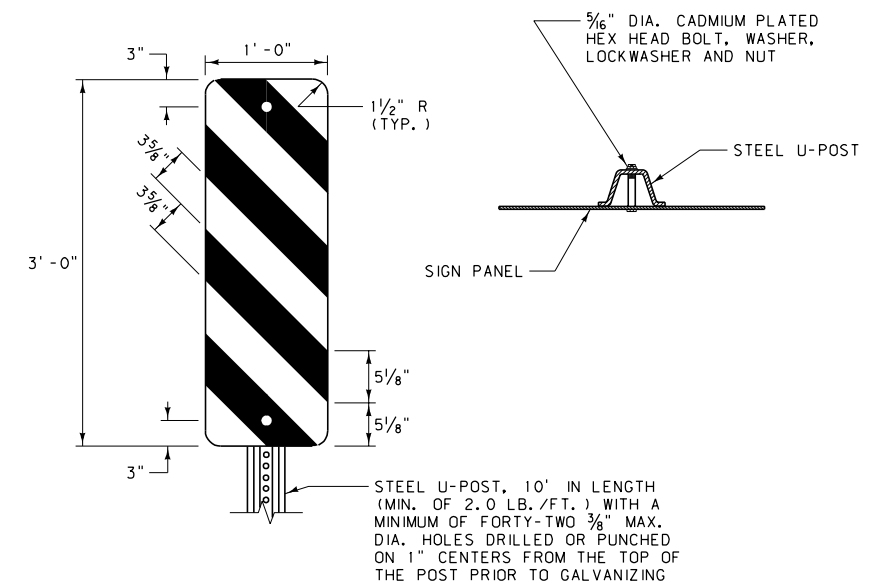
ALTERNATE DESIGN FOR TYPE 2 OBJECT MARKERS IS A YELLOW RETRO-REFLECTORIZED PANEL OF THE SAME SIZE.




PLACE POST AND PANEL(S) SO THAT PANEL(S) ARE DIRECTLY ADJACENT TO INNER-MOST EDGE OF OBJECT NEAREST TRAVELED WAY.

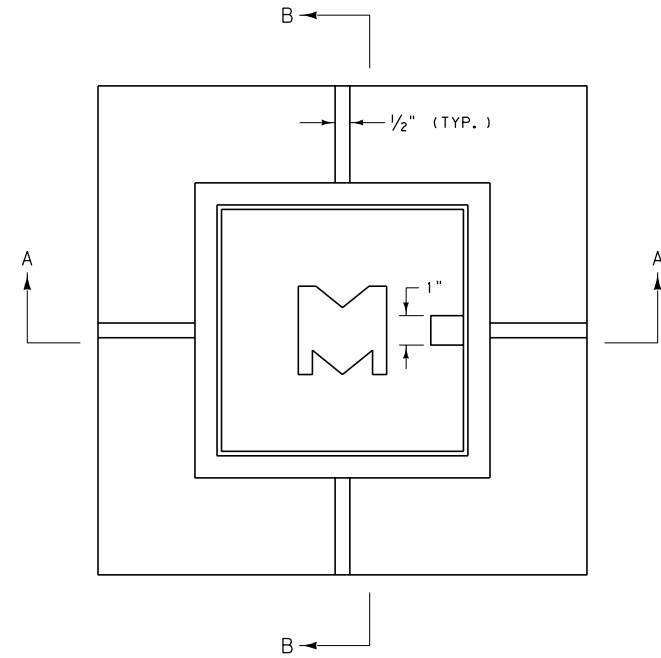
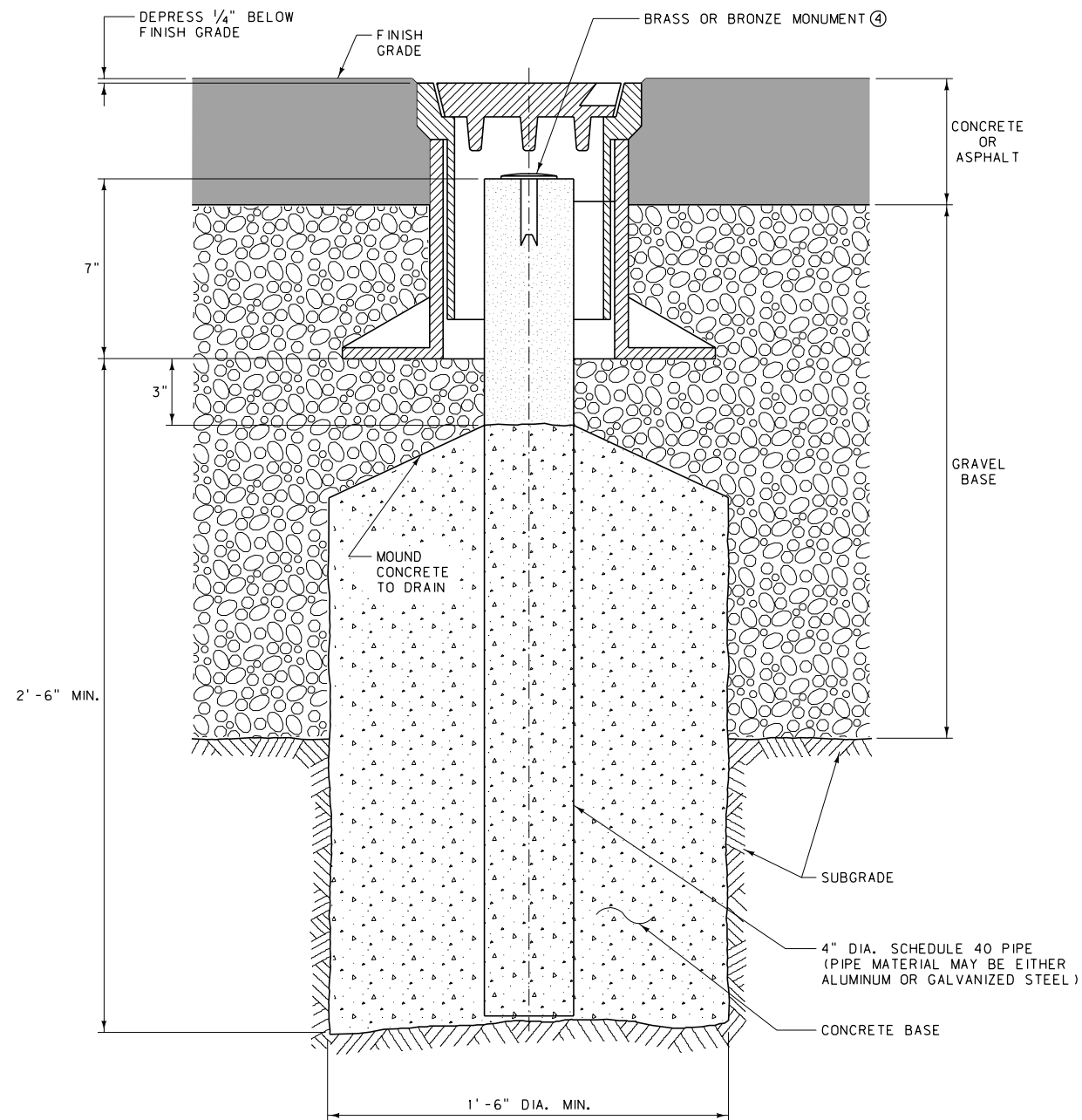
#### TYPICAL USE AND PLACEMENT

TYPE 3  
OM-3  
(OM-3L SHOWN)

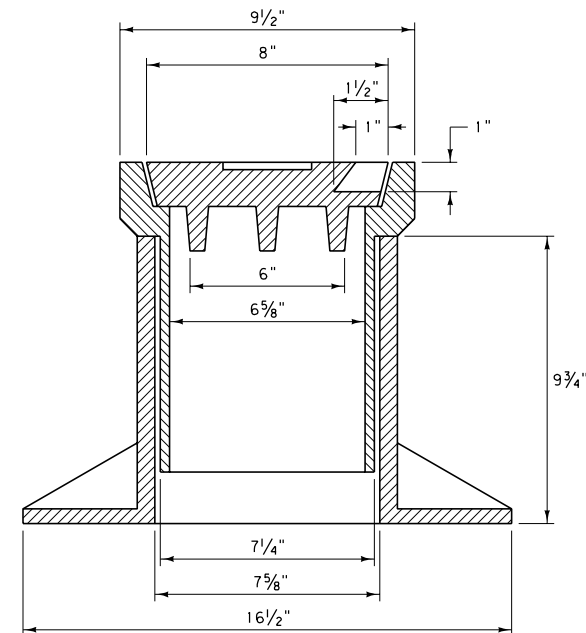


#### TYPICAL USE AND PLACEMENT

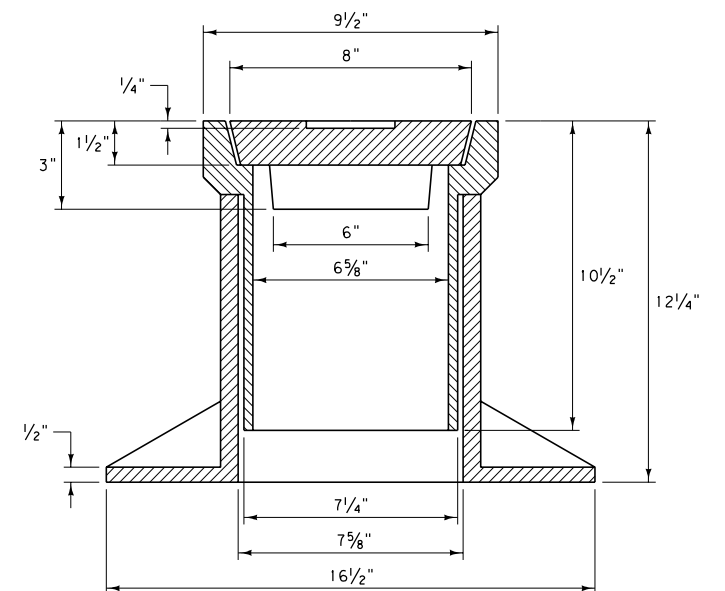
DETAILED DRAWING	
REFERENCE	DWG. NO.
STANDARD SPEC.	619-38
SECTION 619	
OBJECT MARKER DESIGN AND PLACEMENT DETAILS FOR OBSTRUCTIONS ADJACENT TO OR WITHIN HIGHWAYS	
EFFECTIVE: APRIL 2006	
 MONTANA DEPARTMENT OF TRANSPORTATION	



NEENAH FOUNDRY R-1968 TYPE 36-B ADJUSTABLE MONUMENT BOX (HEAVY DUTY) OR APPROVED EQUAL




SECTION A-A



SECTION B-B

NOTES:

- ① INSTALL THE 4" DIA. PIPE, CONCRETE BASE AND ADJUSTABLE MONUMENT BOX AS DETAIL. PLACE CONCRETE IN THE PIPE UP TO 10" BELOW THE TOP OF THE PIPE (DO NOT FILL COMPLETELY.)
- ② POSITION THE CENTER OF THE PIPE TO WITHIN  $\frac{1}{2}$ " HORIZONTALLY OF THE DESIRED COORDINATES AND CENTER THE MONUMENT BOX OVER THE PIPE.
- ③ DEPENDING ON CONTRACT REQUIREMENTS, EITHER MDT FORCES UNDER THE DIRECTION OF A MONTANA PROFESSIONAL LAND SURVEYOR OR CONTRACTOR FORCES UNDER THE DIRECTION OF A MONTANA PROFESSIONAL LAND SURVEYOR WILL BE REQUIRED TO SET AND MARK THE BRASS OR BRONZE MONUMENT WITHIN THE BOX AFTER CONSTRUCTION. THE MONTANA PROFESSIONAL LAND SURVEYOR WILL BE REQUIRED TO PREPARE AND FILE CORNER RECORDATIONS IN ACCORDANCE WITH STATE STATUTES, ADMINISTRATIVE RULES OF MONTANA AND PROVISIONS OF THE MDT SURVEY MANUAL. PROVIDE COPIES OF FILED CORNER RECORDATIONS TO THE MDT ENGINEERING PROJECT MANAGER.
- ④ AN ACCEPTABLE BRONZE MONUMENT IS THE "BERNTSEN C25DB" OR APPROVED EQUAL. AN ACCEPTABLE BRASS MONUMENT IS THE "SURV-KAP M/M-BCS-2 $\frac{1}{2}$ D" OR APPROVED EQUAL.
- ⑤ ALL CONCRETE IS CLASS DD OR APPROVED EQUAL.

DETAILED DRAWING	
REFERENCE	DWG. NO.
STANDARD SPEC.	900-15
SECTION	
ADJUSTABLE MONUMENT BOX	
EFFECTIVE: APRIL 2006	
 MONTANA DEPARTMENT OF TRANSPORTATION	